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COMPUTERWORLD

Kahn sings the blues

Software price war forces Borland to lay off 350 workers

By Christopher Lindquist
SCOTTS VALLEY, CALIF

After labeling 1992 "the worst year of my life," Borland International, Inc. founder Philippe Kahn last week laid off 15% of his work force in what he said is the first step in making the company more competitive in an increasingly price-vicious software market.

While the cuts helped to further deflate Borland's stock, the impact they will have on customers is unclear, although Borland said users will see improvements in support and service because of the new efficiencies in the organization.

The layoffs cap a year in which Borland has appeared to be on the verge of losing a look-and-feel suit filed by Lotus Development Corp., has accused a key former executive of bringing confidential documents to a competitor and has failed to get its Windows products out. The company now faces increased pressure from Microsoft Corp., which bested Borland by launching its own Windows database at Comdex/Fall '92.



Borland's Philippe Kahn *blames Microsoft and Lotus for the software price war*

In July, Kahn promised to ship Windows versions of the Paradox and dBase databases by summer's end [CW, July 6]. Both are now expected to ship early next year.

The 350-person layoff comes as a result of an ongoing software price war that will require software companies to change their thinking, Kahn claimed.

Kahn was quick to blame the "price war" on Microsoft and Lotus and, in particular, on their extremely low per-seat suite pricing. However, Borland's own pioneering pricing battles on the competitive upgrade front are often seen as the catalyst for the emergence of truly low-cost, major-brand software.

Whatever the cause, Kahn said he sees a future that contains much cheaper software — more along the lines of the $99 upgrade than the current $495 to $795 retail model. Kahn pointed to Microsoft's introductory offer of $99 for Access as an example.

Borland may be in "a death spiral," according to Jim Geisman, president of Marketshare, Inc. in

Borland, *page 16*

DB2 to get client hooks

By Jean S. Bozman
CHICAGO

■ IBM's top database strategist said last week the firm will provide two new building blocks next year for creating distributed databases: data management software that will prepare corporate DB2 data for client/server applications and a "browser" that will give users a road map to corporate databases.



Daniel Wardman, database strategy manager at IBM's Santa Teresa Laboratory near San Jose, Calif., said a copy manager to automatically create database "extracts" and the OS/2-based Business Information Locator would remove key technical barriers to implementing client/server applications in large corporations.

Both products are considered vital components of IBM's evolving Information Warehouse blueprint, Wardman said at the Database World conference.

Analysts said they believe IBM is making the moves in recognition of the shift away from mainframe-centered information systems strategies based on IBM 3270 terminal sessions for MVS applications toward distributed client/server systems that reside in corporate business units.

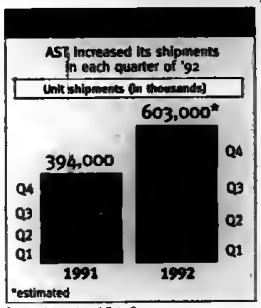
IBM, *page 10*

AST launches to sharpen image

By Michael Fitzgerald
IRVINE, CALIF

■ AST Research, Inc. is planning an extendad holiday party to toot its own horn and push new products. For starters, it will expand its PowerExec notebook line next Monday and will follow that up with a mid-January revamp of its Premium line of desktops and servers, according to sources.

The combination of talk and products appears to show a dramatic shift in AST's strategy, which was designed to help erase the question mark next to its name as the PC industry splits into "haves" and "have-nots."



Source: International Data Corp.

This surge of energy comes at a time when AST needs to take some dramatic steps to pump up its presence in the market, analysts said.

"They're posturing, and it's a good thing for them to do," said Andrew M. Seybold, editor in chief of "The Outlook on Professional Computing," a newsletter based in Brookdale, Calif. "People want to buy from a winner, and they're posturing themselves as fast-growing and strong enough to be a winner."

Some users have always questioned the quality of AST's products, and some may be concerned about the stability of the firm's management following the departure of co-founder Tom Yuen in June.

AST, *page 14*

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Re-engineering rewards

In a year in which everyone seems to be re-engineering something, what does it take to be the nation's best user of technology to boost business? Look no further than Banc One Corp., the acquisitive Columbus, Ohio-based banking conglomerate that topped more than 60 tough competitors to win *Computerworld*'s first annual Excellence in Re-engineering award.

National correspondent Mitch Betts tells how Banc One boosted earnings 25% and revolutionized banking sales and service. See story page 93.

Winning combination

COMPUTERWORLD'S 100

Banc One Corp., Columbus, Ohio

ANALYSTS SAY THERE IS A CLOSE LINK BETWEEN BANC ONE'S BUSINESS-DRIVEN TECHNOLOGY INVESTMENTS AND ITS ENVIABLE PROFIT GROWTH

- IS budget: $293 million
- IS budget as percentage of revenue: 7%
- Profit growth 1987-1991: 28%
- *Computerworld Premier 100* ranking: No. 3 in finance industry

Source: 1992 *Computerworld Premier 100* CW Chart: Janell Genovese

Executive Briefing

A comprehensive guide to the week's news

RE-ENGINEERING

Banc One wins *Computerworld*'s Excellence in Re-engineering award for several initiatives, including the Strategic Banking System, that revolutionize the way banking is done. *Page 93*

PC SOFTWARE



There are already thousands of Windows utilities, including some standout shareware products. Which ones are the most effective? Often those that add to or enhance the environment rather than replace parts of it. *Page 101*

Users outline some of their long-term needs for IBM/Apple joint venture Taligent. *Page 57*

OLE 2.0 defines a path for future Microsoft operating systems. *Page 57*

INDUSTRY

IBM is expected to announce further expense cuts during the next month. *Page 4*

The outcome of the FTC investigation against Microsoft may come more in the form of a whimper than a roar, if history is to be believed. *Page 129*

Borland's downward slide continues as CEO Philippe Kahn acknowledges a tough year, announces 15% layoffs and blames cuts on what he claims is an impending software pricing war. *Page 1*

CLIENT/SERVER

IBM's top database strategist told users at a Chicago database conference that the firm would provide two data management products to ensure that its Information Warehouse is widely used in client/server applications. *Page 1*

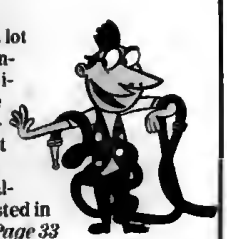
A move to client/server is likely to be costly and fraught with organizational and training challenges, according to a new study. *Page 89*

Users at a database show approach client/server gingerly, but vendors are far more bullish. *Page 10*

TELECOMMUNICATIONS

Hewlett-Packard and Ericsson take on the Herculean task of building integrated, cross-country network management systems for carriers, aimed at reducing cost and service implementation lead time in foreign countries. *Page 12*

SYSTEM DEVELOPMENT



The computer industry would be a lot healthier if vendors would concentrate more on usability and practicality and less on trying to create the ultimate in power and performance, consultant and author Art Gillis says. Users aren't getting what they need out of what they already have, so they aren't interested in buying more powerful versions. *Page 33*

The advent of object-oriented technologies foreshadows a day when the model in a simulation will cease to be merely a representation of a new system and will actually become the new system. *Page 28*

Security

Computer security expert says popular encryption schemes may not be safe. *Page 6*

Hacker charged in Air Force data theft. *Page 6*

PC hardware

AST plans to use new products and self-promotion in an effort to claim a place to the first tier. *Page 1*

"Restocking fees," "free service" and "complete money-back guarantee" are phrases used in mail-order ads that sound simple but can spell trouble even for the initiated. *Page 121*

Compaq goes direct — sort of. *Page 8*

Too busy for holiday shopping? Here are some last-minute gift ideas for the computer user. *Page 60*

Unix



Attendees at Sun User Group Conference & Exhibition last week worried about Solaris 2.1 migration issues and whether Sun has a strategy for dealing with Microsoft's Windows NT. *Page 7*

Big iron shops find a kinder, gentler way to transition to Unix, with a Unix version of the ISPF mainframe text editor. *Page 80*

Large systems

D-Day for Alaska Airlines' cutover from an EDS reservation system to AMRIS' Sabre is approaching, and the company is sharpening its pencils because for a few hair-raising hours, it will have no computers available at all for processing customer requests. *Page 77*

DECUS attendees are excited about Alpha's potential, but some say corporate management is skittish about approving DEC purchase plans. *Page 14*

DASD durability

USERS RATED HITACHI DATA SYSTEMS TOPS IN RELIABILITY AMONG MAINFRAME STORAGE PRODUCTS.

SEE BUYERS' SCORECARD, PAGE 84

Product	Reliability rating
HDS' 7390	9.6
EMC's Symmetrix	9.3
Amdahl's 6390	8.8
IBM's 3390	8.5

MAXIMUM POSSIBLE SCORE: 10 RESPONSE BASE: 103 USERS



The Banc One team helped change the way the world thinks about banking processes. *Page 93*

A spate of minicomputer product announcements from HP focus on software enhancements for its proprietary line while adding a dozen blazing boxes to its Unix hardware lineup. Amid the flurry, HP added relational capabilities to its TurboImage database. *Page 12*

Application development

Users hate it when you show them prototype software and then tell them they have to wait months or years for the real thing. But that's how software developers work today. They should instead create software rapidly, delivering to users a basic working system that can grow and evolve to contain all the features users need. *Page 109*

Encompass, a joint venture of AMR and CSX, recently completed the first version of its global shipment tracking system. Applications for the ambitious client/server system were built with tools from Uniface. *Page 89*

Legal issues

Data-over-cellular patent holder Spectrum Information Technologies cracks down on enforcing license fee payments amid rumors that wireless bigwig AT&T is considering acquiring the firm. *Page 4*

LANs

CW Editor in Chief Bill Laberis talks about the trend of users' turning over their LANs to IS — and the price they'll have to pay for doing it now instead of earlier. *Page 32*



Open systems

Users cite management and security as the primary generators of hidden costs in migrating to open systems in this month's User Voices poll. 65

Careers

Minorities can succeed in IS, says Ben Berry, a manager of computer services at Hughes Aircraft in Los Angeles. But getting ahead takes a carefully crafted strategy. Berry suggests that minority group members need to develop political savvy and remain flexible about the size and types of companies they'll work for. 113

Preparing for a promotion to a high-level position? Here is some advice that might smooth your transition. 115

DBMS

Big, mission-critical databases of names and addresses need sophisticated search software, users say. 77

Microsoft's Access is positioned to serve two types of users: those who want it as a database management system and those who want it as a tool to query enterprise databases. 66

Imaging

Exploring relatively uncharted waters, National City Bank of Cleveland will test a scalable, microprocessor-based imaging system in its item processing operation. 66

Enterprise networks

Standards bodies and users mull a response to end the network standards battle. 69

3Com adds a twist to the low-end router market with a new software architecture that eliminates administrative changes to remote devices. 14

Mass garment maker Byer California leverages the X Window System to meet time-to-market deadlines. 69

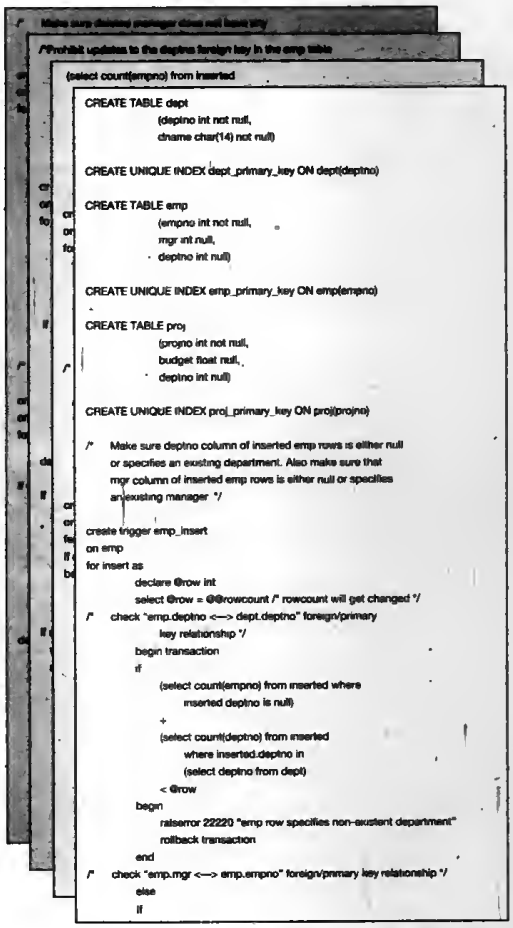
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REFERENTIAL INTEGRITY

SYBASE

200 LINES OF PROPRIETARY CODE



```
/*Prohibit updates to the deptno foreign key in the emp table
(select count(empno) from inserted
CREATE TABLE dept
        (deptno int not null,
        dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
        (empno int not null,
        mgr int null,
        deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
        (projno int not null,
        budget float null,
        deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*  Make sure deptno column of inserted emp rows is either null
    or specifies an existing department. Also make sure that
    mgr column of inserted emp rows is either null or specifies
    an existing manager */

create trigger emp_insert
on emp
for insert as
        declare @row int
        select @row = @@rowcount /* rowcount will get changed */
/*  check "emp.deptno <--> dept.deptno" foreign/primary
            key relationship */
        begin transaction
        if
            (select count(empno) from inserted where
                inserted.deptno is null)
            +
            (select count(deptno) from inserted
                where inserted.deptno in
                (select deptno from dept)
            < @row
        begin
            raiserror 22220 "emp row specifies non-existent department"
            rollback transaction
        end
/*  check "emp.mgr <--> emp.empno" foreign/primary key relationship */
        else
        if
```

*Program code independently written and tested.

ORACLE7

12 LINES OF INDUSTRY STANDARD SQL

```
CREATE TABLE DEPT
  (DEPTNO NUMBER(2) PRIMARY KEY,
  DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
  (EMPNO NUMBER(4) PRIMARY KEY,
  MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
  DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
  (PROJNO NUMBER(4) PRIMARY KEY,
  BUDGET NUMBER(7,2),
  DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
    ON DELETE CASCADE);
```

These two programs do exactly the same thing: direct the server to enforce business rules to ensure data integrity. Oracle does it in 12 lines of industry standard SQL. Sybase requires 200 lines of their vendor proprietary language, Transact-SQL™. If productivity is important to you call 1-800-633-1071 Ext. 8186 for a free copy of "Client/Server Database: Getting it Right" by programmer productivity expert Steve Schur.

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Wireless questions multiply

Standards, bandwidth issues concern users considering the technology

By Lynda Radosevich and Joanie M. Wexler
BOSTON

There was muted enthusiasm for emerging wireless technologies and services at the Wireless Datacomm '92 conference last week.

Would-be users said they were excited by the possibilities of wireless local- and wide-area networking but are concerned about several outstanding issues. These include a lack of cross-technology standards, bandwidth limitations and blurred distinctions among the relative merits of competing wireless telecommunications technologies: data over cellular and packet radio.

For example, Leo Moerkens, manager of service information systems at Phillips Medical Systems in Shelton, Conn., said his intent to link 900 field engineers to the company's IBM mainframes will depend on the maturity and ubiquity of wireless telecommunications.

His company, which sells X-ray, ultrasound and other equipment to hospitals, plans to equip the engineers with notebook computers so they can access dispatch information and customer files while they are on the road.

To make the system viable, he said he expects a one- to two-year payback in cost reduction due to improved efficiency.

The expectation seems reasonable. Robert Euler, vice president of marketing at Ardis Co., the provider of the Advanced Radio Data Information Services (Ardis) network which spans 400 U.S. metropolitan areas, told conference attendees that nearly all Ardis customers have seen nine- to 18-month paybacks.

However, a major technical consideration for wireless service shoppers in the mass business market is the nonportable nature of users' mobile computing devices among the various wide-area services, said Andrew M. Seybold, publisher of the "Outlook on Professional Computing" newsletter, who chaired several show sessions.

Within the cellular market, users can change service suppliers without changing equipment. But emerging packet radio services running in different frequencies and using different protocols mean users cannot mix and match their equipment and applications among cellular and radio services. This limits dissatisfied users' ability to change providers.

Seybold and others have formed an association to address this issue (see box at left). Meanwhile, Seybold advised users to choose a wireless service before they invest in portable computing gear.

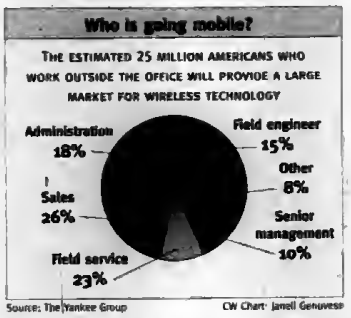
Applications guide choice

Analysts noted that users' applications play a role in the choice of a cellular or packet radio service. Roberta Wiggins, senior analyst at Boston-based consultancy The Yankee Group, said that packet radio is generally more appropriate for short, bursty messaging because of its error-correction and security features.

Users needing far-reaching service coverage today might choose cellular because of its ubiquity, she said, though "cellular is not as reliable for data."

Cost also plays a big role. United Parcel Service, Inc., for example, uses both the Ardis network and cellular provider GTE Mobilenet for two separate applications. An Ardis customer for an on-call pickup application, the shipping firm reportedly chose cellular for communicating delivery and pickup information to its 50,000 trucks simply because it was cheaper.

Wireless LAN technology presents its own challenges. For example, users may inadvertently become disconnected from the LAN if they step outside its transmission range. But the technology intrigues some users. A conference attendee who requested anonymity said he wants to install wireless LANs in his firm's warehouse stores, which currently use stand-alone workstations to design home improvement room layouts for customers.



The stores lack drop ceilings and inside walls to run network wiring in; wireless LANs could solve that problem and allow users to easily move workstations.

James Cavin, an education consultant at Teleload Corp. in Raleigh, N.C., said wireless LANs could simply be a cheaper solution to networking his company's 10 PCs because of traditionally high cabling labor costs.

IBM braces for more cutbacks

By Johanna Ambrosio
ARMONK, N.Y.

■ Within the next several weeks, IBM is expected to disclose details of another round of expense cuts, which may include more plant closings and reallocation of personnel, industry watchers said last week.

The company may also announce either the first layoffs in its history or another incentive program to get people out the door.

Other possible actions include cutting old or unprofitable product lines.

An IBM spokesman would neither confirm nor deny rumors of a special board meeting to be held this week to discuss these issues, nor would he comment on any pending announcements.

But IBM executives have said for some time that unless the company's financial situation improves, they would have to take further steps to trim expenses. Frank Metz, IBM chief financial officer, told a gathering of analysts in August, "We'll take the actions necessary to close the financial equation."

"It wouldn't be a big surprise to see layoffs," said Wendy Abramowitz, an analyst at Argus Research in New York, echoing a consensus of other industry observers.

"We all expect many more employees to leave, whether that's by using the 'L' word or through another incentive program," said Barry Bosak, an analyst at Smith Barney, Harris Upham & Co. in New York. "But no one really knows anything, and the uncertainty is killing us."

Already this year, some 40,000 IBM employees have left the company by means of an early-retirement program. By year's end, IBM expects to have 300,000 employees on its roster.

One reason further action may be necessary is because of the continuing economic softness. Although the economy in the U.S. is improving slightly in some sectors, market conditions in most European countries continue to be weak.

"The issue is Europe and Japan," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "If those countries don't improve, then no one in the technology business is safe no matter who you are — IBM, Digital or Sun."

In recent weeks, IBM has also been reeling from several major setbacks. Among them is trouble with its contract to supply an air traffic control system to the Federal Aviation Administration (FAA). The FAA reportedly has had some problems getting some of its IBM software to work, and IBM has yet to provide a fix.

Additionally, IBM's stock fell 4%, to $62.75, last week after Standard & Poor's put the company on its CreditWatch list, indicating it is considering lowering IBM's credit rating because of difficult near-term market conditions.

Cellular analog patent disputed

By Joanie M. Wexler
HANOVER, N.Y.

A dispute over Spectrum Information Technologies, Inc.'s patent for technology that allows data to travel over analog cellular networks heated up last week when Spectrum said AT&T might consider acquiring Spectrum to get control of the patent.

An AT&T spokeswoman declined comment on whether the company was interested in buying Spectrum. She also declined comment on Spectrum's patent claims and said the dispute is between AT&T's suppliers of wireless modems and Spectrum.

Spectrum's hardware and software technology links cellular telephones with data modems. This allows nomadic corporate users with portable computers to send data over wireless networks instead of having to rely on cabled networks.

The Spectrum patent issue could inhibit the cellular efforts of vendors such as AT&T, IBM and Motorola, Inc., which are seeking opportunities in the burgeoning wireless market. The market is pegged at $150 million today by The Yankee Group and is expected to grow to $500 million by 1995.

Possible roadblock

Potential legal squabbling over the applicability of the patent to other vendors' devices could stall product and service development. As with any patent, enforcement of license fees would increase manufacturing costs to cellular vendors, which get passed to end users.

The patent, however, was already validated and reissued to Spectrum last month by the U.S. Patent Office despite opposition from modem maker Microcom, Inc. in Norwood, Mass., which uses the cellular technology in its modems. Shortly thereafter, Spectrum filed suit against Microcom for patent infringement.

The $100 million Spectrum has had some success in enforcing its patent; it recently received a letter of intent from Data Race, Inc., a maker of cellular modems, to license its technologies. Data Race, which is reportedly paying a seven-figure up-front licensing fee plus royalties, supplies modems to AT&T subsidiary NCR Corp.

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News Shorts

Univel starts shipments

Univel, the San Jose, Calif.-based joint venture between Novell, Inc. and Unix System Laboratories, Inc., has begun shipping its new UnixWare family of network products. UnixWare, which Univel claims bridges the Unix and Novell NetWare operating environments, is available in Personal Edition, Application Server and Software Development Kit packages. According to Univel, more than 150 vendors are shipping or have announced products for the UnixWare environment.

Work-flow server for Notes

Lotus Development Corp. and Action Technologies, Inc. last week gave more details on how they will provide work-flow software to work with Lotus' Notes. At the same time, an Action Technologies executive said the companies will not release a product by year's end as originally planned. Lotus and Action Technologies have developed a work-flow server that will run as a companion product to Notes. While some pilot versions have worked with the current release of Notes, the companies are positioning the work-flow server to run with the yet-to-be-released Notes Version 3.0. Action Technologies also said it intends to offer a software developers kit so users and third-party developers can tailor their applications to run in a work-flow environment.

Clinton years, sans Young and Sikes

Federal Communications Commission Chairman Alfred C. Sikes said he will resign Jan. 19, the day before President-elect Bill Clinton is inaugurated. He did not say what he planned to do after that, and Clinton has not said who will replace him. Appointed by President George Bush in 1989, Sikes was generally liked by corporate telecommunications users for his efforts to increase competition and foster the deployment of new technology. Meanwhile, John Young, recently retired chief executive officer of **Hewlett-Packard Co.,** dashed the hopes of many when he said he was not in the running for secretary of commerce in the Clinton administration. He cited appearances of conflict of interest over his substantial business holdings.

Free-lancer wins copyright

A federal appeals court recently decided that a free-lance programmer will be allowed to hold the copyrights to software written under contract because the programmer was not a W-2 employee of the firm. The Second U.S. Circuit Court of Appeals in New York reversed a lower court decision against the programmer, Clifford Scott Aymes, of Robbinsville, N.J., who had written an inventory-tracking and cash-flow program for **Island Swimming Sales, Inc.** in the early 1980s. The court ruled Aymes was entitled to the copyrights because the firm did not give him health or Social Security benefits.

SHORT TAKES **Data General Corp.** snagged **Storage Technology Corp.** executive Larry Hemmrich for general manager of DG's new Clariion storage system unit, which is due to ship its first redundant arrays of inexpensive disks systems for Unix machines from **Sun Microsystems, Inc.** this month.... **SunConnect,** the Sun subsidiary that handles networking products, is moving its headquarters to Grenoble, France, and expanding its staff by 20%, the company said last week.... **Empress Software, Inc.** in Greenbelt, Md., released a DOS version of its Empress relational database management system, written for use with Unix systems.... Novell has begun shipping a new NetWare in-Place Upgrade Utility that will simplify upgrading local-area networks from NetWare 2.1 and 2.2 to 3.1 t by allowing users to upgrade a server without first off-loading the data to a backup server.

News Shorts, *page 16*

Encrypted data at risk?

By Gary H. Anthes
GAITHERSBURG MD

A member of a government/industry advisory panel on computer security said last week that using existing technology, it takes only a few hours to unscramble data encoded by two popular encryption algorithms.

The assertion, which two major software vendors challenged, adds fuel to user concerns that privacy protection now available in software is inadequate. It also strengthens vendor arguments that federal export regulations are inhibiting the deployment of the best encryption methods.

Stephen Walker, a computer security expert and president of Trusted Information Systems, Inc. in Glenwood, Md., said that for about $50,000 it would be possible to harness the power of 100 microprocessors to derive 40-bit encryption keys — the maximum allowed in products for export — from an encrypted message in three hours or less. Walker based his analysis on the performance of an encryption chip offered by Cylink Corp. in Sunnyvale, Calif.

More ominous, Walker said an experimental chip in use at Digital Equipment Corp. could do the job in less than 18 minutes.

"I submit this is a pretty big issuo," Walker told the quarterly meeting of the Computer System Security and Privacy Advisory Board. "As I began to explore this, I became very frightened."

The 40-bit limit was part of an agreement reached last July between the Software Publishers Association and the Bush administration [CW, July 7]. National Security Adviser Brent Scowcroft agreed to allow the export of mass-market software using two encryption algorithms — called RC2 and RC4 — licensed by RSA Data Security, Inc. in Redwood City, Calif.

Domestic implementations of RC2 and RC4 typically use 64-bit keys. However, exportable versions would have to be limited to a less-secure, 40-bit key.

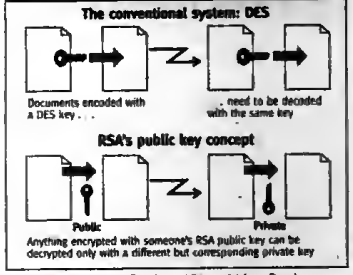
Scowcroft refused to ease restrictions on the export of products using the more secure 56-bit Data Encryption Standard (DES) algorithm, which is widely used in the banking industry. According to Walker, his hypothetical 100-processor machine would need 23 years to crack DES.

The 15-year-old DES algorithm is a government standard that the government is likely to soon reaffirm for an additional five years. But some members of the computer security board said last week that whatever is allowed for export will become the de facto standard in mass market software because vendors will not develop two versions of products. If the de facto standard becomes RC2 and RC4 with 40-bit keys, users will be exposed, several members said.

Officials at Novell, Inc. and Microsoft Corp. challenged Walker's analysis, saying it oversimplified the job of cracking encryption keys. They also pointed out that chips devoted to RC2 and RC4 encryption do not exist.

But Alan Eldridge, security architect at Iris Associates, Inc., which developed Notes for Lotus Development Corp., said, "It's not an issue of whether Walker is right or wrong. Users make similar calculations and reach similar results. We get frequent and loud complaints."

All keyed up



Source: Computer System Security and Privacy Advisory Board

Notorious hacker charged with stealing fed secrets

By James Daly
SAN FRANCISCO

An infamous electronic bandit who once used the computer network alias "Dark Dante" was charged with stealing a secret Air Force military document that listed the names and locations of structures to be attacked in the event of war.

Kevin Poulsen, a former Sun Microsystems, Inc. programmer who has been jailed for the last 20 months following an unsuccessful attempt to avoid earlier hacking charges, was named in a 14-count indictment returned last week by a grand jury.

In January 1990, the 27-year-old Poulsen, along with Mark K. Lottor and Robert E. Gilligan, was accused of conspiring to break into government and Pacific Bell Telephone Co. computers, stealing and trafficking in telephone access codes, obtaining unpublished phone numbers for the Soviet Consulate in San Francisco and wiretapping conversations of Pacific Bell officials who were investigating them.

Poulsen fled and remained at large until April 1991, when a tip in response to the television show *Unsolved Mysteries* led to his arrest.

The most recent indictment is likely to supersede the earlier charges, said Assistant U.S. Attorney Robert Crowe, who is prosecuting the case.

Lottor, whose case has been severed from Poulsen's, remains free on bail, and his trial will probably occur after Poulsen's. Gilligan pleaded guilty to the original charges and is now working with the government on the case, Crowe added.

Poulsen's latest indictment marks another chapter in his troubled legal history. He and another hacker were accused of illegally accessing computers at the University of California at Los Angeles in what was one of the first computer hacking cases prosecuted. His juvenile status shielded him from prosecution at the time.

He later went to work for Sun, which had a government contract to develop a computer system for the Air Force's Caber Dragon 88 exercises being conducted at Fort Bragg, N.C., according to an Air Force memo filed in court. It was then that Poulsen allegedly retrieved an Air Force Tasking Order that set forth commands for the exercises as well as the name of actual military targets, the government said in court papers.

An electronic copy of the document was later discovered during a search of Poulsen's apartment, Crowe said.

If convicted of the new charges, he could get a sentence of eight to 10 years in jail. Defense attorney Paul Meltzer has contended that the Air Force order was reclassified after the fact to raise the potential penalties against Poulsen. Crowe insisted this is not true. A federal judge is set to rule on the matter Feb. 1, and a trial will follow soon thereafter.

Sun users wary of Solaris migration

By Maryfran Johnson
SAN JOSE, CALIF.

Concerns about migrating to Sun Microsystems, Inc.'s just-released Solaris 2.1 operating system were uppermost in the minds of those at the Sun User Group Conference and Exhibition last week.

"Everyone here is looking forward to Solaris 2.1 with a little bit of dread and anticipation. It's a big transition," said Walter Herrich, a systems programmer at the University of California at Berkeley's Space Sciences Laboratory, which has 40 to 50 Sun machines on its network. "I don't know what problems we're going to see," he added, "but this is the direction Sun is going, so there isn't much choice."

Solaris, Sun's first implementation of Unix System V, Release 4, has been dogged by more than 1,000 bugs since its release last summer. With most of the initial bugs banished from 2.1 and symmetrical multiprocessing capability added, Sun is hoping commercial users will forge ahead with their migration plans now.

The conference, which drew about 1,800 users and exhibitors, focused on the impact of Solaris 2.0 and alternatives to it. "People come to this conference looking for answers," said Stan Hanks, president of the Sun User Group and principal scientist at Technology Transfer Associates, a consulting group based in Bellaire, Texas.

Letting its guard down

Several other issues explored at the conference seem to indicate an overall concern that Sun needs to pay more attention to both its technical customers and other industry players. Some discussion focused on issues such as Sun's reaction, or lack thereof, to the threat posed by Microsoft Corp.'s Windows NT operating system and a broad perception that Sun is not listening as well as it should to the user group.

Hanks noted that many of the same technical system administrators who once had only their Unix machines to worry about are now senior executives charged with caring for multivendor environments.

"The promise of open systems was that anything on your network would work with anyone else's equipment, but the reality is a support nightmare," Hanks said.

Sun's dismissive, indifferent attitude toward Windows NT was another concern.

"It's not just that NT will be an advanced operating system. It's all those applications Microsoft can bring to the table," said one systems administrator at the Department of Defense who asked not to be identified. "I can hear the footsteps of NT. Everybody can."

One defense Sun might mount against NT, he suggested, would be to improve and more tightly integrate its Deskset tools and applications for office environments.

Sun, meanwhile, set up its own "listening booth" on the exhibit floor, where a steady stream of customers lined up to air complaints or offer suggestions. Still, the Mountain View, Calif.-based vendor has historically paid scant attention to the user group — even though its average member is responsible for spending up to $250,000 on Sun gear, Hanks estimated.

"Users really would prefer us to be an effective conduit of information for Sun, but frankly, we're not," the user group president said bluntly. "Sun specifically does not want user feedback."

The recent introduction of the $3,995 SPARCclassic color workstation also drew its share of attention at the conference.

Jesse Charfauros, a senior systems administrator at Brooktree Corp. in San Diego, said the PC-priced SPARCclassic will have a "big impact at small companies," particularly in health care and the legal profession. "The ability to get the distributed computing power of Unix at such a low cost per seat is very appealing," said Charfauros, whose company network includes roughly 100 Sun machines.

Unix system administrators are increasingly called on to integrate their networks with PC-LANs, one user at Chevron Oil Co. said. "I'm getting three calls a week now on this subject, while a year ago hardly anyone asked about it," said the system's administrator, who asked not to be identified.



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INNOVATION 20 YEARS

Compaq adopts direct (mail) effort

By Michael Fitzgerald
HOUSTON

After months of flirting with selling through direct mail, Compaq Computer Corp. last week said it would give five direct marketers the right to sell some of its products.

Compaq's ProLinea desktops and Contura notebooks as well as its LTE Lite 25C color notebook will be the first product lines to be resold by five mail-order houses. As Compaq catches up with demand for its other lines, they too will be handled by direct-mail resellers, said Ross Cooley, senior vice president of Compaq North America. Only certain high-end models of its server line will be exempt from what he acknowledged was not a true mail-order effort by Compaq.

Compaq opted to set up a direct-mail channel, rather than sell products directly to end users, to keep from infuriating long-time, loyal resellers. "This is not Compaq doing mail order; this is a group of organizations ... who will represent us to customers who like to buy via mail order," he said.

Cooley said Compaq estimates that 700,000 units will sell via mail order this year.

Analysts called the move an extension of the broad strategic shift Compaq began after firing founder Joseph "Rod" Canion in November 1991.

"It's a logical toe-in-the-water approach to getting into direct mail," commented Kimball Brown, vice president of Infocorp in Santa Clara, Calif.

The five vendors who will resell Compaq products are Granite Computer Products, Inc. in Alameda, Calif.; Insight Distribution Network, Inc. in Tempe, Ariz.; PCs Compleat, Inc. in Marlboro, Mass.; PC Connection, Inc. in Marlow, N.H.; and USA/Flex in Bloomingdale, Ill. Granite is affiliated with MicroAge, Inc.; insight with Computer-Land Corp. and USA/Flex with Comark, Inc. Cooley said 11 companies submitted proposals to Compaq.

Analysts said Compaq's heavy reliance on affiliates of the mainstays of its reseller business would help keep dealers from becoming disgruntled.

Competitors downplayed Compaq's move.

"We want to be where customers want to buy, too, but we don't see direct as a way for us to go," said Safi U. Qureshey, president and chief executive officer of AST Research, Inc. in Irvine, Calif.

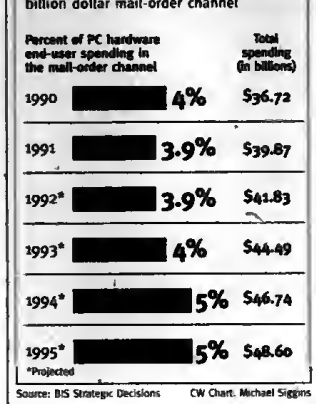
Qureshey said that while many vendors, including the IBM PC Co. and more recently Zenith Data Systems and NEC Technologies, Inc., have commenced efforts to go to mail order, "most companies will do a poor job of creating the business because they don't have the mentality for it."

Cooley responded that "Safi and [Hewlett-Packard Co.] are beating the dealer-only drum, and I'm the original Indian on that drum. But if your goal is to be No. 1, you have to have your products available in a variety of channels."

"From a strategic point of view, it's good for us because we've been known for software and peripherals," said Martha Danly, director of business development at PC Connection.

Special delivery

Compaq will try to claim a portion of the billion dollar mail-order channel



Source: BIS Strategic Decisions CW Chart: Michael Siggins

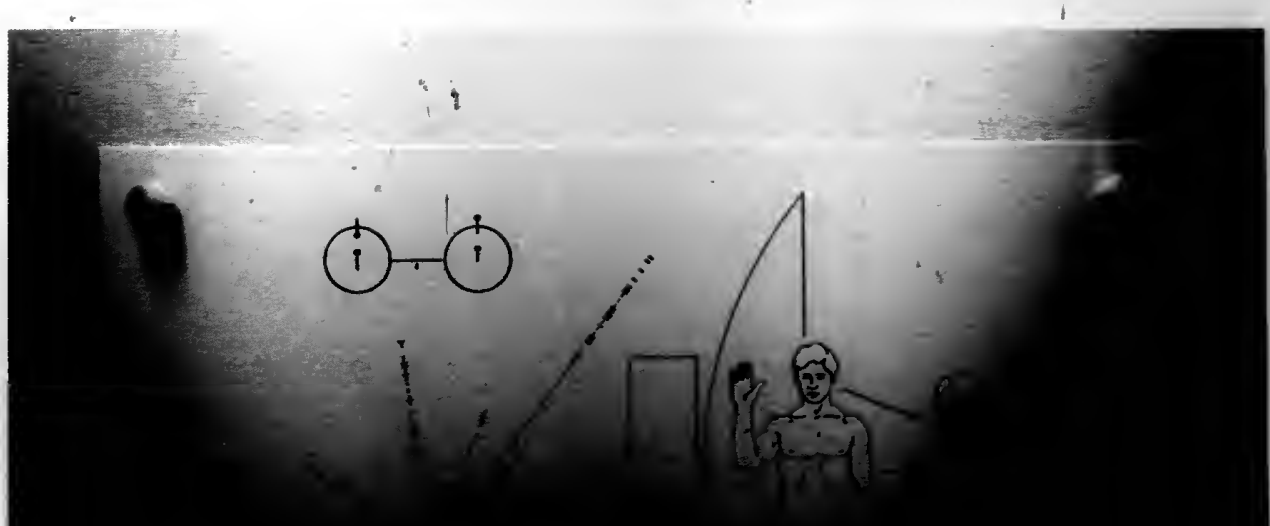
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IBM's DB2 to receive client hooks

CONTINUED FROM PAGE 1

Competitors Sybase, Inc. and Oracle Corp. are also scurrying to address the issue.

Wardman said IBM research indicates that many users are unable to find the DB2 and legacy data they need to access — even though their PCs can connect to the mainframes that hold the data. This is because IS managers at IBM sites have relied on a limited set of mainframe utilities to extract vital data from production IBM databases for use with client/server applications such as IBM's DXT product for DB2, he said.

For example, Joseph Iannello, manager of information resources at Amerada Hess Corp. in Woodbridge, N.J., said his firm uses an IBM utility to make "shadow copies" of DB2. However, the process, which is cumbersome, saves the entire database instead of just posting changes to an existing one.

Users also lack software tools that will enable administrators to describe corporate data in useful terms rather than listing it.

"We started out in our [Distributed Relational Database Architecture] thinking all we had to do was the hip-bone-connected-to-the-thigh-bone stuff," Wardman said. "But we didn't put the data in context for the user, and some people spent 80% of their time looking for data and only 20% analyzing it."

The Business Information Locator product would allow programmers to create customized database labels for local-area network-based client/server query applications. IBM will deliver a tool kit that will allow database managers to collect information on data categories contained in distributed databases — even those from other vendors' databases, such as Oracle 7.

Smart control needed

Some of the 1,500 users attending the conference agreed they need more utilities and tools for effective data management in organizations with large IBM mainframe data centers.

"It all comes down to who will manage the data repository," said Kingsley O'Kuesa, president of General Masters, Inc., a Bellwood, Ill., consulting firm. "There's a ton of information out there, but your business users may only require 50 to 60 [DB2] fields out of the thousands on the mainframe. You need an intelligent machine that can interpret all the requests coming in."

Some said IBM's Information Warehouse is at the top of their priority list, as they work to make end-user data access to centralized corporate databases real. "That's the only reason I came here," said Ed Geno, a systems manager at Southwestern Bell in St. Louis. "We're trying to get access to legacy systems and to provide the right information to the right people."

As pilot client/server projects go into production, database administrators are beginning to see the gaps in the Information Warehouse armor, analysts said.

"Once you go beyond the plumbing of client/server computing," said Aaron Zornes, a senior software analyst at Meta Group, Inc. in Westport, Conn., "you start to worry about server-to-server interactions and management of the data warehouse."

Users skeptical

While IBM has been working to provide an integrated data management tool set, several of IBM's business partners, including Informatinn Builders, Inc. and Micro Decisionware, Inc., announced more data access software last week.

The move encouraged users but failed to convince analysts that IBM is putting the final touches on its Information Warehouse.

"Client/server technology looks good on paper, but when people try to implement it, they run into roadblocks," said Charles Phillips, a research vice president at SoundView Financial/Gartner Group, Inc. in Stamford, Conn. "I think users like the idea of enterprisewide connectivity but are not convinced that there have been enough [user] successes to buy into it."

Different strokes

Other vendors have taken alternative approaches to managing data accessed via client/server applications. Sybase, Inc. announced a new set of data management utilities for backup and recovery in its System 10 relational database system, scheduled to ship in 1993. Part of the package is a Replication Server, which will update multiple database servers, and the OmniSQL Gateway, which will allow applications to view many database servers as one virtual database. Oracle Corp.'s new Oracle 7 database management system, slated to ship in volume next year, supports two-phase commit, real-time updates on multiple servers and can take "snapshots" of an Oracle 7 system for delayed updates on other servers.

Software surplus

Software for IBM's Information Warehouse dominated third-party announcements made at last week's Database World conference. Among the highlights were the following:

- **Information Builders, Inc.** in New York said its Enterprise Data Access/SQL (EDA/SQL) client/server connectivity software would support IBM's CICS transaction-monitoring software for mainframes in 1993. Also announced was a Novell, Inc. NetWare Loadable Module version of EDA/SQL and support for Digital Equipment Corp.'s AccessWorks data servers.
- **XDB Systems, Inc.** in Laurel, Md., unveiled a Unix version of its XDB-Server, which reportedly will allow users to program IBM DB2 applications on Sun Microsystems, Inc. workstations.
- **Micro Decisionware, Inc.** in Boulder, Colo., announced a version of its DB2-compatible Database Gateway product for Microsoft Corp.'s Windows NT operating system. The firm also said IBM will begin selling its client/server software directly to IBM customers.
- **Progress Software Corp.** in Bedford, Mass., announced that its relational database and tools would support Univel's UnixWare client/server software for Novell networks. A software license ranges in price from $1,000 to $8,600, depending on its configuration.
- **Microsoft** said it has shipped hundreds of beta-test copies of a version of its SQL Server product adapted to the 32-bit Windows NT.
- **IntelliCorp, Inc.** in Mountain View, Calif., introduced a version of its Prokappa object-oriented development platform for IBM RISC System/6000s running AIX.

—Jean S. Bozman

Users step carefully to client/server

By Ellis Booker
CHICAGO

Excitement tinged with apprehension was how several attendees at Database World & Client/Server World here last week expressed their feelings about the distributed computing model.

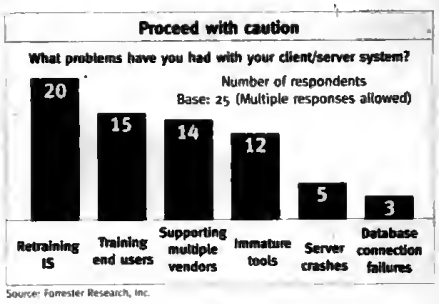
While a number of attendees said they had small pilot projects under way, nearly all said they planned to go quite slowly when it came to using client/server technology for mission-critical systems.

"We're a bit conservative," said Christopher Book, a team leader at Waste Management, Inc. in Oakbrook, Ill. Waste Management has deployed client/server configurations such as Lotus Development Corp.'s Notes, "but we're still developing a strategy for core business applications," Book said.

An ancillary obstacle, Book said, is that the firm has "long-term contracts and commitments" with a number of application developers for its legacy systems.

The city of Chicago has been installing local-area networks for its departments and is trying to link a mixed bag of Unix and proprietary servers, but it is still far from its goal of providing data access across the enterprise. "We're going through the client/server upheaval," admitted James Dunne, a technical support manager for the city and manager of a systems integration team formed last year.

Some information systems groups have trouble meeting user expectations about the alleged cost savings of client/server.



"It's hard to make it clear to users that this isn't necessarily cheaper than a mainframe," agreed Jill and Dave Harlow, a husband and wife team who are an analyst and a database administrator, respectively, in the IS department at Caterpillar, Inc. in Peoria, Ill.

For Rod Cressey, user services manager at the University of California at San Diego, the biggest problem is not getting information from hosts to desktops. "My biggest problem is making [users] understand what they're looking at on their desktops."

Vendors, not unexpectedly, were more bullish. "Within two years we'll turn off all our proprietary hardware and run exclusively on our own platform," said Nancy Colwell, director of commercial tools and technologies at Sun Microsystems Computer Corp. Sun uses a 4-year-old Amdahl Corp. mainframe running CA-IDMS for its worldwide manufacturing system.

But Bob Walsh, a database administrator at Bank of Boston, said, "I suspect the legacy stuff will pretty much stay where it is. The units have their business structured around the existing systems."



New horizons

The convergence of technologies at the desktop, in communications and in portable systems, promises new organizational opportunities, said Lotus Chief Technology Officer John Landry. "Coordination, not automation," will be the theme in the 1990s, he said, arguing that synchronized, server-based databases will be able to meet this challenge.

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GSA Contract Number GS00K90AGS5251-PS02.

HP bolsters 3000, 9000 lines

By Mark Halper
PALO ALTO, CALIF.

Hewlett-Packard Co. last week enriched its minicomputer line with a flurry of additions that included enhanced software bundles for its proprietary machines and a dozen Unix boxes that blazed through benchmark testing.

The juxtapositioning of the HP 9000 Unix hardware introductions in relation to the software orientation of the proprietary HP 3000 developments illustrated the bifurcation of HP's user base along the two product lines.

HP 3000 users are more interested in prepackaged solutions; HP 9000 users are focused on hardware performance advancements and are inclined to find or develop their own software, said Wim Roelandts, general manager of HP's Computer Systems organization.

Different perspective

Industry analysts said they did not see the differences from quite the same perspective. They noted that HP is under less pressure to advance 3000 hardware because HP's 3000 user base is essentially a captive audience, while 9000 users have other Unix hardware choices.

HP expects to sell more 9000s than 3000s in 1993, following a year in which unit sales of the two lines were about even, said Rich Sevcik, general manager of HP's Systems and Server Group.

With those market realities in mind, HP last week said it is offering several models in the 3000 line that are loaded with discounted networking and performance management software, among other features. The so-called Plus System Packages also include HP's new relational version of its TurboImage database, now called ImageSQL. With Allbase, it now has two relational databases (see story at right).

The bundled systems include an HP Vectra PC, and prices range from $143,000 for an HP 3000 Series 947RX Plus to $301,000 for an HP 3000 Series 987SX Plus. All include the MPE/IX operating system, a 100-user license, 64M bytes of memory, a 1G-byte hard drive and 2G bytes of digital audio tape backup. Some models have 12 expansion slots, and others have four.

On average, those prices are 20% less than what users would pay for the same configurations without the new discounts available with the Plus system packages, HP said. The company will also offer Allbase in the package for between $7,000 and $33,000.

Additionally, HP said it enhanced its EtherTwist router for the 3000 and that it added unlimited runtime support for various Posix standards to the 3000's MPE/IX operating system. Although HP's 3000 enhancements centered around software, the company did add four hardware models, all of which have four expansion slots and sit in a niche between HP's two-slot and 12-slot systems.

The new 937RX, 947RX, 957RX and 967RX range in price from $33,500 to $123,000 for base models, which include MPE/IX; the relational version of HP's Image database; a 100-user license; 64M bytes of memory; 1G byte of storage and 2G bytes of backup storage.

The new 3000 systems fall into the middle of the 3000 line and are not built on the latest version of HP's Precision Architecture-RISC chip, the 7100.

Meanwhile, three of the 12 new Unix systems are built on the 7100. HP last week boasted that these outperform IBM's top-of-the-line Application System/400 by 70%, running TPC-A benchmarks. The company also claimed that one of the models, the 150, ran the best ever price per tpsA — $5,913 (see chart).

HP also said the new systems include lower cost frame-relay access, an enhanced EtherTwist router and faster and larger Small Computer Systems Interface disks.

HP's new 9000 systems span the performance range. A sampling:

F Class: For small businesses/branch offices

F10	2	30.4*	$11,014	$12,250

G Class: For small businesses/workgroups in large companies

G30	4	88.1	$8,259	$20,000

H Class: For medium-size businesses/depts. in large companies

H40	8	310.5	$8,479	$56,000

I Class: For divisions in large companies

I50	12	184.5/303.1*	$9,946/$5,913	$103,000

*host-based configuration **performance metric of TPC-A

Source: Hewlett-Packard Co. CW Chart: Stephanie Faucher

All in the family

HP pumped up its 3000 product family with the following options:

- **HP OpenView Console,** a Windows-based systems and network management tool.
- **HP TurboStore/UX,** a data backup program with on-line capabilities.
- **HP AutoRestart/UX,** an automatic restart program.
- **HP ThinLAN 3000/UX,** an Ethernet card.
- **HP LaserRX/MPp** for gathering and analyzing performance information.
- **HP RX Forecast,** which signals the need for a software upgrade.
- **HP GlancePlus/UX,** which analyzes bottlenecks.

Turbo-charged sleeper

During what one industry analyst called the "sleeper" portion of last week's announcements, HP said it is adding SQL capabilities to its TurboImage database to convert the product into a relational database management system.

The move essentially gives HP two RDBMSs: Allbase and ImageSQL. But the relational modification will come at a cost to users.

Rich Sevcik, general manager of HP's Systems and Servers Group, said HP will increase the support charge for the new Image but does not plan to increase the price for the product. HP has not yet determined new support pricing, he said.

Image users have always applauded the database for its high-speed performance. HP product line manager John Goulden explained that Image will continue to outperform Allbase but will not be as thoroughly relational.

Although HP added SQL hooks, ImageSQL does not have two-phase commit or a distributed transaction processing monitor, he said. ImageSQL, like TurboImage, will be positioned for use by smaller shops, he said.

Users and analysts applauded HP's decision to make ImageSQL available as part of new packaged 3000 systems.

"This could be the sleeper product of the year," observed Eric Fisher, a principal at Fisher Systems Consulting in Groton, Mass. "I think there's going to be overwhelming interest in that option. There's been a huge [push by] users to make that part of the bundle."

Anthony Furnivall, president of SDL Software, Inc., a Buffalo, N.Y., developer of HP software, described ImageSQL as "the most significant" of the hardware and software product announcements made by HP last year. Image "now has complete access to SQL front ends," he pointed out. — *Mark Halper*

HP, Ericsson unite for global net management

By Joanie M. Wexler
STOCKHOLM

In an ambitious effort to solidify the management of disparate worldwide public telecommunications networks, Hewlett-Packard Co. and Ericsson, Inc. last week said they have formed a joint venture that will ship integrated network management products to telephone companies early next year.

The move — if it flies with most worldwide carriers — will likely first benefit users encountering snags in implementing network services across a European Community composed of incompatible systems, said Jim Carlson, HP's marketing manager of telecommunications for the Americas.

Carlson said he anticipates that Ericsson's Telecommunications Management and Operations Support (TMOS) system and HP's data expertise should lower phone service costs and improve service response to end users. This is because the venture aims to standardize billing, customer service systems and the monitoring, design and maintenance of switched networks.

A need exists for faster service implementation and consistency among intracountry network management information. Global advertising firm Young & Rubicam, Inc. in New York, which is planning a European network, is looking at a six-month wait for 64K bit/sec. data service among seven major European cities, said Howard Maynard, senior vice president and director of MIS. "That seems like a long time," he sighed.

Also, "If there's any way to get consistent network information from different geographical areas, that would be of value to us. But that would require a lot of consistency in how those telcos identify customers and standardization in coding," he said.

Herculean task

The seemingly gargantuan task makes Maynard skeptical about the vendors' plans to sell new network management systems to Postal Telephone and Telegraph authorities and other phone companies that have management systems in place.

"I wouldn't like to have a sales quota for selling telcos a new management system — though I hope I'm wrong," he said. The vendors did not name any telephone service providers that have committed to the Ericsson/HP platform.

Installed in 15 countries, TMOS will constitute the software framework and will run on all HP hardware platforms. The venture will also work with third parties to build integrated applications for their platforms.

The joint venture, called Ericsson Hewlett-Packard Telecommunications AB, will be 60% owned by Ericsson and 40% owned by HP. Products — including HP's entire hardware line — will be distributed through Ericsson's sales force.

Local-area network management was not included in the announcement, though Carlson said a separate project with Telecom Australia is under way to blend a plug-in telecom management platform with HP's LAN-oriented, Unix-based OpenView platform for integrating local- and wide-area network management.

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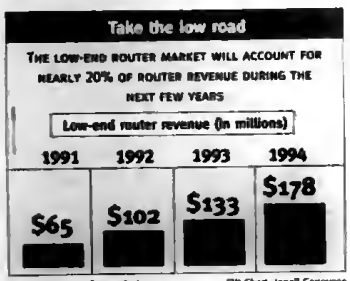
3Com eyes new route

By Joanie M. Wexler
SANTA CLARA, CALIF.

3Com Corp. last week attempted to one-up last summer's domino-like rollout of simplified routers designed for scattered, lightly staffed sites.

The vendor has developed a new architecture for feeder routers — those that sit on the periphery of sprawling corporate networks — to ease enterprise network management by off-loading much of their complexity to backbone routers.

Dubbed Boundary Routing System Architecture, the technology takes industry efforts to ease router network management a step further than flash erasable programmable read-only memory (EPROM) approaches from companies such as Proteon, Inc., Cisco Systems, Inc., Wellfleet Communications, Inc. and Hewlett-Packard Co. By transferring much of the feeder device software to u centralized high-end router, any changes made to the main router automatically translate networkwide.



The "flash-upgradable memory," or EPROM, approach from other vendors does do centralized downloading of router table changes and software upgrades networkwide. But network administrators must still configure the changes and download them to a number of sites, said Fred McClimans, u program director at Gartner Group, Inc., u consultancy in Stamford, Conn. In the 3Com scenario, central staff tweaks the main router, not worrying about those attached to it.

However, because the concept depends on nonmesh router configurations in which feeder routers are star-wired to u central router, the applicability of the architecture could be limited. Many users are likely to have some remote routers directly connected to each other.

For example, "We have remote routers talking directly to each other in u partial mesh configuration for redundancy," said Coyne Gibson, manager of information technology at Convex Computer Corp. Jeff Krause, director of internetworking technology at 3Com, said the flash EPROM approach is better suited to this scenario.

But John Merritt, u vice president at Southwest Network Services, Inc., an Austin, Texas, network systems integrator, said the product would fit in more than 50% of the sites his company has networked or bid on during the last few months. "All these customers would have use for this somewhere in their network," he said.

Gibson countered that maintaining u router network is "not a big thing." He noted that dynamic routing protocols mean that u change somewhere in the network is made networkwide.

The architecture will probably first appeal to 3Com shops because 3Com's high-end router will be first to get the necessary software upgrade. Users will be able to mix boundary routers with other vendors' backbone routers once the upgrade software becomes open.

DEC faces scrutiny from user management

By Melinda-Carol Ballou
LAS VEGAS

Although the mood at last week's Digital Equipment Computer Users Society (DECUS) meeting was decidedly upbeat, many information systems managers conceded that they face increasing skepticism from upper management when it comes to purchasing Digital Equipment Corp. products.

IS managers were excited about new DEC technologies such as Alpha AXP. But more than u dozen attendees said that as the Maynard, Mass., company keeps pruning products and staff, management is concerned about DEC business practices.

"Corporate management seems to prefer to purchase new PCs rather than continue to feed existing VAX machines with their high cost of software and maintenance," said DECUS member Douglas Wilson, who asked that his employer not be named.

So if loyal IS managers are to make u convincing case for DEC products, DEC must better market products to decision makers.

"I see other vendors who offer poorer products with sexy front ends that impress [our managers]. But those products don't have the same management and security features that you get with DEC," said one user at u pharmaceutical firm.

DEC's plan to restructure into horizontal and vertical business units could help the company get closer to corporate decision makers [CW, Nov. 2], observers said.

But Paul Rayner, u programmer/analyst at the Church of Latter Day Saints in Salt Lake City, said buying products from DEC remains difficult. Issues for Rayner and others include an inability to access data on relevant products. Others cited the inflexibility of software licensing.


Stanley Rose

The way we were

DEC's briefings on Alpha's ability to run Microsoft's Windows NT piqued user interest. "That's where the excitement is — it's like the VAX sessions used to be 10 years ago," said Stanley Rose, vice president of Bankers Trust Co. Attendance at a Microsoft preview of DOS 6.0 was 1,500.

"There are also truckloads of old hardware going to the dump . . . because DEC will transfer operating system licenses and support only if you have the original [owner and paperwork]," Wilson said.

The ability to license software across VAXclusters is u concern for Rockwell International Corp. user Brian Fairweather, who is excited nonetheless to use Alpha as a common platform for Unix and VMS systems.

But altering licensing options is not enough. When DEC changed its licensing practices earlier this year and cut some prices, it also eliminated discounts.

Stephen Tihor, assistant research scientist at New York University, said, "The problem is that DEC believes the Digital difference is worth 10% to 20% [more], and the company needs to rebuild its position [based] on quality and [lower] pricing."

While users have troubling business concerns, DEC is making a different kind of effort at this symposium to seek customer input, said Marge Knox, president of the U.S. DECUS chapter. These efforts included a last-minute decision by Jack Smith, senior vice president of operations, to attend the symposium; and a commitment from Chief Executive Officer Robert Palmer to attend in the spring.

AST launch

CONTINUED FROM PAGE 1

Despite the questions, AST is not only persevering — it is prospering. The company grew more than 30% in fiscal 1992 to $944 million in sales, and it looks on pace to hit at least $1.2 billion in 1993. AST has moved nimbly, coming from nowhere to be a Top 3 player in notebooks.

Customers contacted said AST has succeeded by meeting their needs. "They've listened to my input on products, and it's definitely a reason why I stay with them," said Terry Nugent, office automation specialist at Hitachi America Ltd. in Brisbane, Calif.

Abraham Chait, product manager of desktop computers and peripherals at Pacific Gas & Electric Co. in San Francisco, agreed. "We're standardized on AST and Compaq, and we get excellent service from them; both companies are very responsive to our technology needs."

Despite user praise, AST has had difficulty establishing itself as a first-tier vendor. Yuen's exodus and a more than 50% drop in profits year-to-year in the first quarter in the wake of the recent price wars have not helped matters, either.

Safi U. Qureshey, AST's cofounder, president and chief executive officer, termed both events "painful" and said price-cutting in 1993 would be geared more to normal drops in component costs and manufacturing efficiencies. He said that any time a founder leaves a firm, an unstable period follows.

At the same time, "business is good" for the cost-conscious company, which remains profitable and has reduced its long-term debt.

AST's inability to break into the first tier may be the result of perception problems. It has been way ahead in some trends and refused to follow others. For instance, AST was the first major vendor to plunge into a variety of consumer channels.

AST's refusal to enter business areas before it feels it and the market are ready has led to charges it is slow in responding to the market.

Qureshey acknowledged AST must "become more visible" in the market and "more aggressive in coming out with new products."


Safi Qureshey

The products

Next Monday: 386SX-based entry-level PowerExec. **January:** New Power Premium desktops, servers that use the Video Electronics Standards Association's VL local bus, native 1,024 by 768 monitor support, external cache and Pentium upgradability. **Late Qtr:** A 3.5-pound subnotebook code-named Aladdin. **AST** declined comment.

John O. Dunkle, president of market researcher WorkGroup Technologies, Inc. in Hampton, N.H., cited AST's coming product line (see box), which might have given it u stronger presence in the market's late-year volume surge. "It sounds like they've got the right game plan, but will the clock run out before they implement it? You almost want to kickstart them because if those products are indeed coming to market, it's too bad AST is missing the fourth-quarter volume ramp-up."

But Dell Computer Corp. released u similar product line only this month. AST redesigned its low-cost Bravo line earlier this year.

Qureshey defended AST's penchant for following the market rather than fads. "This is a marathon, not a sprint, and we are trying to be the Honda of the computer business. If we come up with cars our customers want to buy, we'll achieve our financial objectives," he said.

Global integration alliance formed

Inacom, ICG band together to serve multinational organizations

By Michele Dostert
OMAHA

Proving that it has taken the global economy doctrine to heart, Inacom Corp., a nationwide reseller and systems integrator, has formed an alliance with Paris-based International Computer Group (ICG), one of the largest computer services companies in Europe.

According to the companies, this makes ICG the largest systems integration consortium in the world, with 353 locations in the U.S, the Asia Pacific region and 16 European countries.

The alliance will allow U.S.-based multinationals to coordinate the design, purchase, installation and support of their global information systems through one source—Inacom.

Inacom officials pointed out that the new alliance will allow ICG and Inacom to leverage not only their systems integration knowledge but also their expertise in distribution and marketing to much larger markets than either company could reach on its own.

ICG's European and Asian corporate customers can now look to Inacom's U.S. locations for service and support at their U.S.-based locations.

Welcome change

Inacom's multinational customers welcomed the new alliance. Patrick Carney, director of IS at ASEA, Brown Boveri's power engineering division headquarters in North Brunswick, N.J., said he plans to standardize and connect plants in the U.S, Sweden, Switzerland and Germany next year. He said Inacom "thoroughly understands" the way he does business.

> The alliance will allow U.S.-based multinationals to coordinate the design, purchase, installation and support of their global information systems through one source.

"This new alliance lets me hit the ground running. I don't have to waste three months looking for a European supplier and another three months educating him about our business," Carney said.

Jim Doucherty, general manager at ICG, said the new consortium's goal is to "take the hassle and risk out of border-to-border projects, whether it's the design and implementation of a global network or the installation of two PCs at an overseas sales office."

Analysts who study the computer industry channel said the deal makes a lot of sense.

"I think this was a great strategic move on Inacom's part. They've found a partner that can give them international reach, so they can step up to the table and bid against IBM, DEC, HP, Andersen [Consulting] and EDS on larger, multinational accounts," noted Stephen Clancy, associate director at Dataquest Worldwide Services Group in Framingham, Mass.

Inacom, one of the largest resellers in the U.S., has more than 1,000 sites nationwide, including value-added resellers and systems integrators. According to Rick Inatome, the chairman of Inacom's board, Inacom sales were more than $1 billion in the last year.



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News Shorts

Service bureau, IBM settle

First Financial Management Corp. (FFMC) in Atlanta and **IBM** have agreed to an out-of-court settlement regarding FFMC's Basis banking project. The bank service bureau had filed a $150 million suit against IBM on Oct. 5, alleging among other things that the project had fallen behind schedule because IBM had not supplied enough employees. Neither company would provide any details on the agreement, but a source close to the project said it calls for IBM to pay FFMC damages. An IBM spokeswoman confirmed that as of Jan. 1, IBM will no longer be involved in the project.

Novell reports gains

Novell, Inc. last week reported net revenue of $933 million for its 1992 fiscal year, up 46% from 1991 revenue, and a 53% gain in profits, to $249 million. The company reported 37% revenue growth in the U.S. — the highest since 1987. In a separate announcement, Novell officials flatly denied published reports that they were discussing a possible merger with **Apple Computer, Inc.**

Spice firm's CIO moves on

John Thompson is retiring as **McCormick & Co.**'s chief information officer at year's end. He will continue to work on special projects at the Sparks, Md., spice firm but will also head nearby Loyola College's Lattanze Center for Executive Research in Information Systems. Bob Miller will succeed Thompson at McCormick.

Mainframe turns server

IBM continues its mainframe-as-server push with last week's introductions of new releases of LANres. The new releases for the VM and MVS operating systems add support for Systems Network Architecture, Transmission Control Protocol/Internet Protocol and Novell's NetWare.

Good news, bad news

According to IS leaders at 95 firms that in the aggregate perform 80% of the research and development in North America, Europe and Japan, Japanese firms consistently show stronger alignment between technology and overall corporate strategy than do companies in the other two regions. But the IS executives — according to research by the **MIT Industrial Liaison Program** and Hightstown, N.J.-based **PA Consulting Group** — also indicated that Europe and the U.S. are doing something right on the R&D side. Rated as the top firms worldwide in R&D were **Du Pont Co., IBM, Merck & Co., Glaxo Holdings PLC** and **Sony Corp.**

SHORT TAKES **Giant Food, Inc.** in Landover, Md., will be the first supermarket to test LogicNet, a logistics information network intended to link consumer packaged goods manufacturers with retailers and to synchronize their systems and inventory schedules. ... **NCR Corp.** introduced new deposit-processing technologies for automatic teller machines (ATMs) designed to process electronic images of checks and bills at the ATM rather than in the bank's back office. ... **Computer Associates International, Inc.** announced the Dec. 15 delivery of CA-RET/Xbase, a Microsoft Corp. Windows-based report writer for CA-Clipper, Xbase databases and ASCII file users. ... **Cambex Corp.** in Waltham, Mass., will introduce tomorrow its Stor/9121 memory card for IBM's Enterprise System/9000 family of mainframes, claiming that its price of $880 per megabyte costs 31% less than IBM memory. ... **IBM** said an executive who helped launch the Application System/400, Stephen Schwartz, 58, will retire Dec. 31. ... **Unisys Corp.** has a newly created CIO post and an executive to man it: William G. Rowan, who most recently served as corporate controller.

PC chiefs take industry pulse

Kahn, Gates, Sculley address price wars, need for change

By Kim Nash and Christopher Lindquist
BURLINGAME, CALIF.

Vendors speaking at last week's Technologic Partners conference made it clear that while there are still wars to be fought, opportunities abound.

■ THE FIRST WARNING came from Borland International, Inc., as Chairman and Chief Executive Officer Philippe Kahn stated that a new pricing model, with cheaper prices and thinner margins, was coming into play in the PC software industry. He claimed changes would have to occur if firms were to survive. The next day, change was exactly what happened as Borland announced layoffs (see page 1).



John Sculley: *Opportunities still exist*

■ MICROSOFT CORP. Chairman Bill Gates offered his own recipe for survival. He predicted that future growth opportunities for software companies will lie in the creation of efficient development tools, scalable systems software and hardware innovation independent of software. Not surprisingly, Microsoft is focusing on these three areas.

Gates also suggested that PC software firms could make money by helping companies move their mainframe computing needs down to PCs, a market sector Gates said was sorely underrepresented.

■ APPLE COMPUTER, INC. Chairman John Sculley said the PC hardware price war appears to be slowing. With hardware vendors such as Apple hard-pressed to keep up with demand, he suggested there is little incentive to continue lowering prices.

Sculley stressed that hardware opportunities exist, noting that Apple had spent $1.2 billion during the past two years finding ways to tie mobile devices such as handheld computers and desktop machines to servers in a client/server architecture.

Workplace

Lee Reiswig, newly named president of IBM's Personal Software Products division, updated conference goers on the Workplace Family of products. It will run on a range of systems from handhelds to multiprocessors, an endeavor that pits it directly up against Microsoft's scalable approach to Windows products.

Reiswig also said OS/2 has the potential to allow software developers to finally take full advantage of available hardware and therefore differentiate themselves from other offerings. Such differentiation, he said, would help keep margins higher.

OS/2 should help hardware vendors as it "rapidly makes you want to have more speed, more memory and more DASD capacity," he said.

— Christopher Lindquist

Kahn sings the blues at Borland

CONTINUED FROM PAGE 1

Wayland, Mass. He described that scenario as one in which a company drops its price to sell products, which subsequently lowers the amount of development money. That reduction in development capital causes products to be late, which in turn causes users to jump ship.

"You may be seeing that play out at Borland," Geisman said. He noted, however, that it is still early and that when such a situation occurs at larger companies, it tends to affect individual products rather than an entire line.

While Kahn predicted that "Windows and DOS software prices will keep going down," some analysts and competitors said that the so-called "war" is probably more of a trend toward lower pricing. Users have been witnessing that trend for some time in the form of competitive upgrades, inexpensive software suites and and far-below-retail pricing in the reseller channel.

"I think many of us in the industry would say we've been in a price war," said Lotus Development Corp. spokesman Richard Eckel. "Clearly there has been lots of price maneuvering going on the past 18 to 24 months." He also noted that Borland is often blamed for kicking off the price-cutting rage with its competitive upgrade policy.

New model on horizon

Kahn responded by denying that Borland is the culprit, saying that there is a difference between upgrade pricing and cutting first-time buy prices. He insisted that "a new industry pricing model is emerging," adding that "this reorganization is designed to make Borland leaner, more competitive and profitable."

Death spiral or not, users will be watching closely for signs of change at Borland.

Bob Higby, a Paradox user and director of information systems at a large food manufacturer, said he hopes the layoff was just an "isolated fact."

"It may just mean that they are on their way to better health," he said.

Neal Hill, senior software analyst at Forrester Research, Inc. in Cambridge, Mass., said he does not expect users to see any significant changes in either products or support, at least for the short term. "If I were [Borland], the sacrosanct areas would be R&D, sales and support," he said.

He added that the "internal" areas of sales support and marketing might be hit the hardest, resulting in a downturn in service for resellers but not necessarily for users.

In a teleconference, Kahn said the layoffs will take place across all groups, with two-thirds of the cuts occurring in the U.S. Kahn also said the firm will be "consolidating" into functional areas by jettisoning its product structure in an attempt to streamline operations.

For example, instead of having separate research and development groups for all product groups, such as languages and applications, Borland will consolidate R&D in one group under Bob Warfield, vice president of R&D.

Wall Street was not kind to Borland after the announcement. Several firms, including Bear, Stearns & Co., Kidder Peabody & Co. and Alex. Brown & Sons, Inc., cut their earnings estimates and reduced their ratings for Borland.

Borland's stock price, already down after topping out at more than $80 earlier in the year, dropped 75 cents to $20.75 the day after the announcement.

By anyone's standards, 1992 was a bad year. Whether Borland has come through its trial by fire tempered or burned will be determined in 1993.

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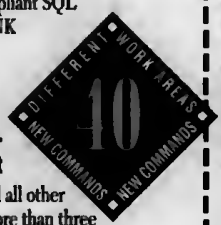
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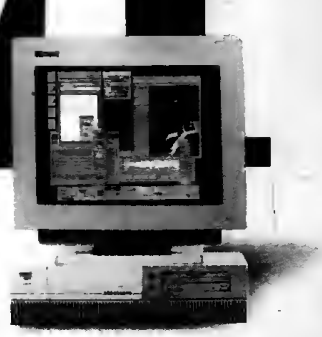
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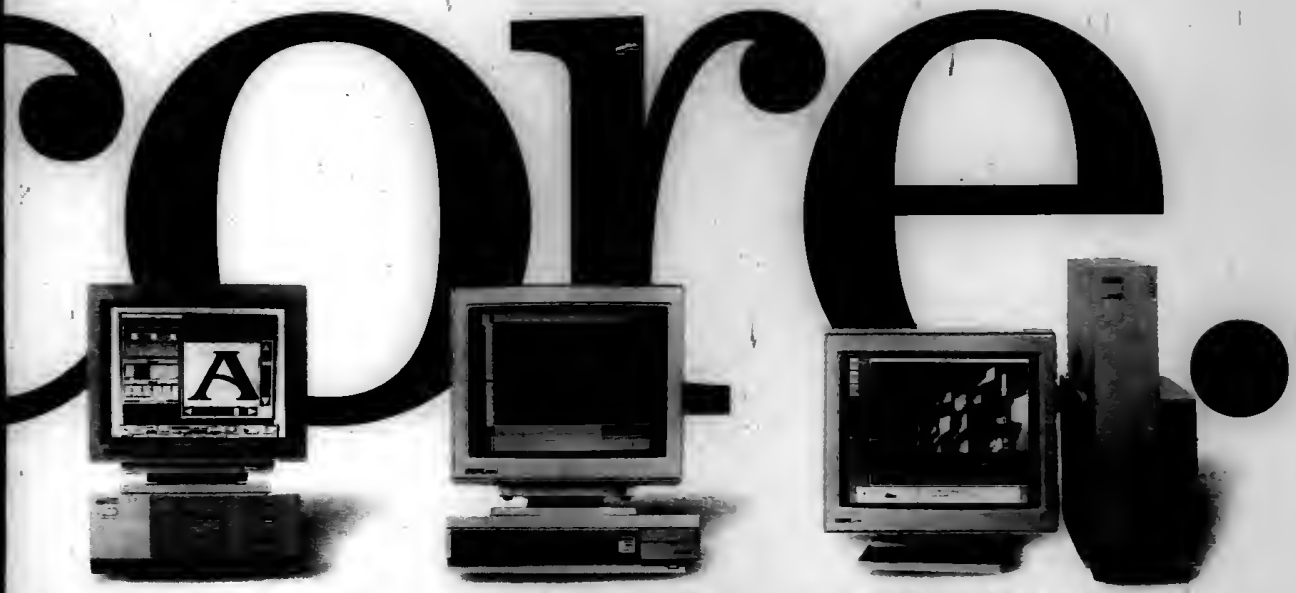
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Outsourcing lures media firm

By Nell Margolis
NEW YORK

A contrarian move into the outsourcing market could position broadcasting behemoth CBS and its insurance affiliate partner, Alicomp, Inc., as major players in the widely anticipated insurance outsourcing boomlet, analysts said last week.

Formerly the information systems department of Amalgamated Life Insurance Co., Alicomp became an independent outsourcing and disaster recovery provider in 1987. In partnership with Comdisco, Inc., it opened the first disaster recovery hot site in Manhattan, also in 1987.

The CBS/Alicomp tandem is targeting "incremental outsourcing" at insurance firms that are moving from mainframe-centric platforms to client/server and other distributed information technology architectures, said Alicomp President Arthur Kurek.

The partnership has already executed one deal: a one-year renewable contract to run all IS operations for Pan Am Corp. as it winds down its corporate activities under the terms of Chapter 11 bankruptcy proceedings. Four more deals are currently under negotiation, according to Kurek.

Outsourcing, however, has proved to be a nightmare for many corporate IS department spin-offs that have ventured into the market. In the past several months, promising entries from Kimberly-Clark Corp. and Sears, Roebuck and Co. have folded [CW, Aug. 10 and 24].

The reason, said Susan McGarry, an outsourcing analyst at Boston-based market research and consulting firm The Yankee Group, is deceptively simple: "The skills that enable you to provide high-quality IS services to an essentially captive intra-company market aren't the same ones you need to go neck-to-neck with the market leaders and a pack of seasoned niche players in a brutally competitive market like outsourcing."

Insurance industry experience

The real ace up CBS/Alicomp's sleeve, according to several analysts, is Alicomp's insurance industry pedigree. Kurek, a former Amalgamated chief financial officer and still an Amalgamated executive, brings two decades of insurance business experience to the mix.

Executive Vice President Lorraine Drake, who used to be Amalgamated's chief information officer, earned her stripes in insurance-specific IS. Insurance firms such as Stamford, Conn.-based Cologne Life Reinsurance and New York-based Health Insurance Plan of New York have joined Amalgamated on the Alicomp client roster.

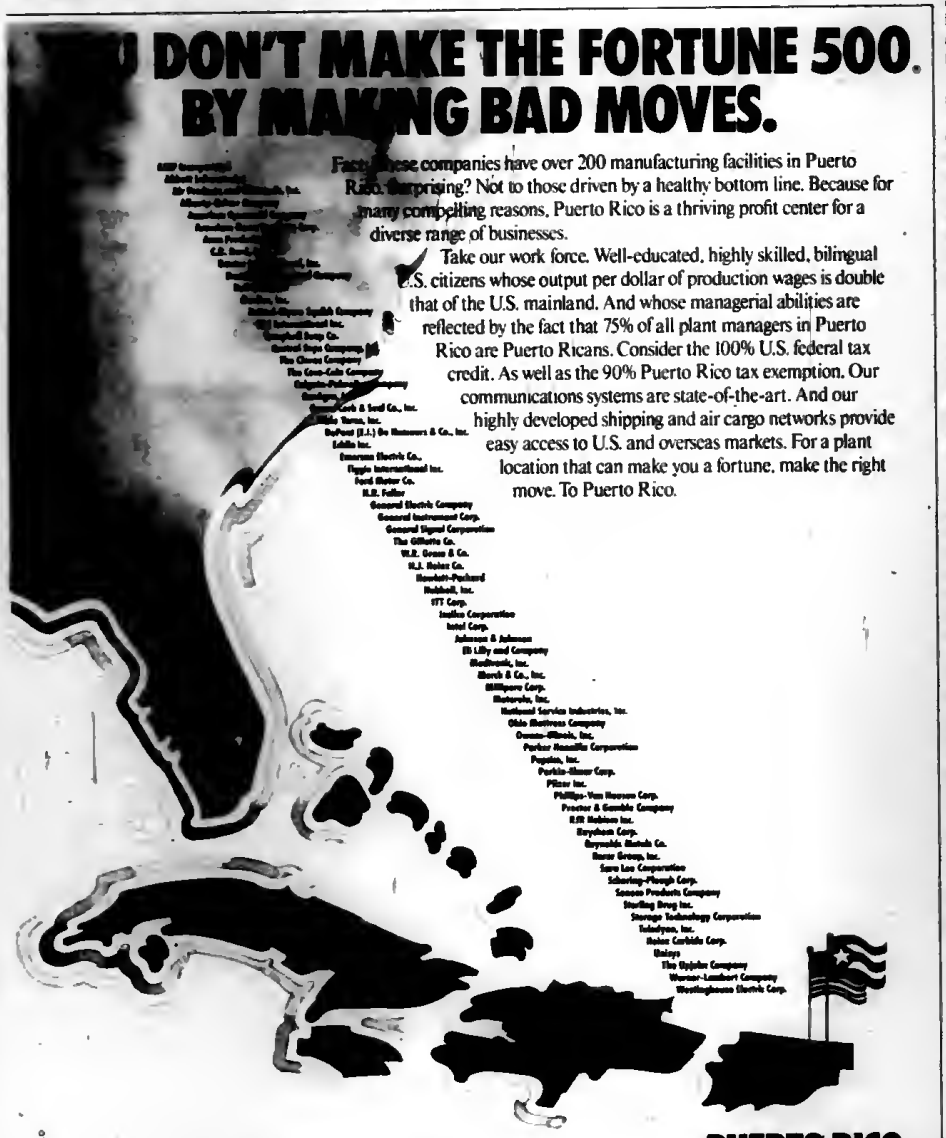
"If they can leverage their insurance roots, they might be able to position themselves very nicely in the front ranks of the vendors that end up outsourcing the major insurance companies — when those companies begin to outsource," said J. P. Richard, an outsourcing analyst at Vienna, Va.-based market research firm Input.

Slow to the trigger

Competitively and financially stressed though many are, the nation's insurance giants have yet to embrace outsourcing. Nevertheless, industry watchers continue to predict that this wall of resistance will fall within the coming year, creating a lucrative outsourcing niche.

The CBS/Alicomp partnership initially will not have to worry about infrastructure. The marketing allies will use excess capacity at CBS' 105,000-sq-ft data center in Secaucus, N.J. CBS, which geared up for the go-go '80s needs of a sprawling conglomerate, no longer requires all of its huge data center's resources now that it has scaled back and tightly focused on its core broadcasting operations.

Alicomp has been quietly growing its New York area regional outsourcing and disaster recovery business during the last five years. Revenue for 1991 outstripped the prior year's by 20%, Drake said, and 1992 will mark an approximately 60% surge.



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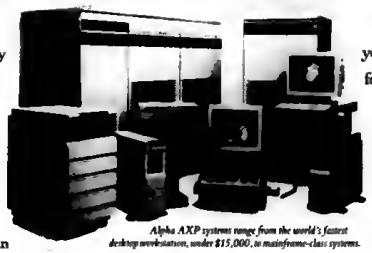
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NCR, AT&T usher in 'smart' ATM technology

By Thomas Hoffman
SAN ANTONIO

NCR Corp. and AT&T Smart Cards have developed a new technology that could make existing magnetic-strip automated teller machine (ATM) cards obsolete.

AT&T's new microprocessor-based smart cards contain several pages of personal, financial and medical information on cardholders that can be used for credit-card services, airline reservations and emergency medical services.

The technology, demonstrated here last week at the Retail Delivery Systems Conference, has been used extensively in Europe and is starting to show promise in the U.S.

According to Diane Wetherington, president of AT&T Smart Cards in Bridgewater, N.J., the AT&T subsidiary has entered into formal discussions with several U.S. banks, airlines and state agencies regarding the use of the smart cards for ATMs, electronic airline ticketing and electronic tollbooths on major highways.

Wetherington declined to name the organizations considering use of the technology, but she said the Italian Postal Bank is already using it to provide its senior citizens with social security debit and credit services.

In addition, Wetherington said, 30,000 cardholders in Milan, Italy, have been using the cards since 1990 for electronic toll collections on city highways.

The smart cards — developed at AT&T Bell Laboratories — are the same size as other bank ATM cards, but they contain microprocessors and memory chips that contain personalized information about cardholders.

> The chips contain a voice print of cardholders that can be applied toward securing ATM transactions as well as reducing ATM and credit-card fraud

For example, the chips contain a "voice print" of cardholders that can be applied toward securing ATM transactions and reducing ATM and credit-card fraud.

According to Wetherington, the cards were also designed to carry digitized pictures and fingerprints of the cardholder.

Cost considerations

However, the cost of integrating smart-card technologies with ATM equipment might outweigh potential profits for banks, according to James Moore, chief executive officer at Mentis Corp., an Eden, Md., financial services technology research group.

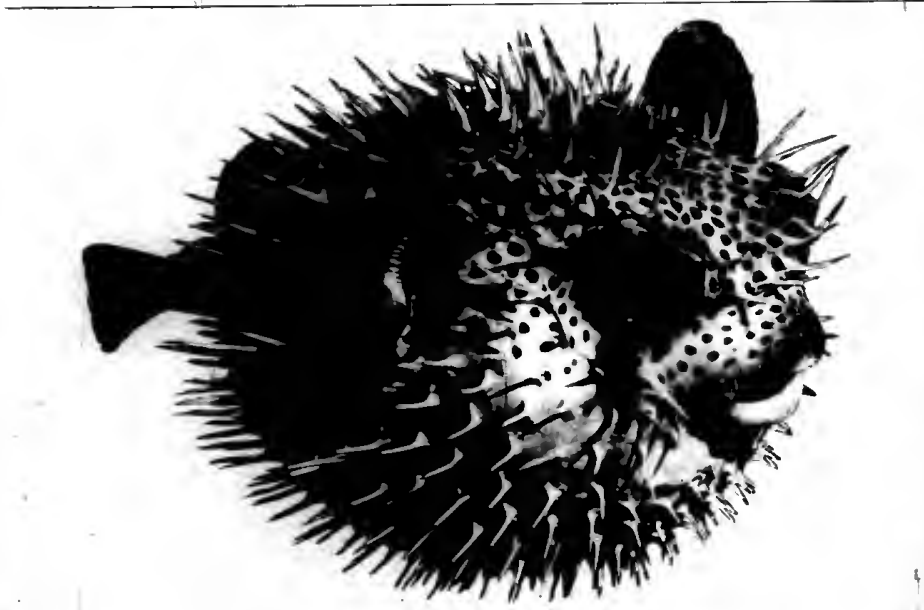
"Bankers would perceive the technology as more expensive than the [ATM] fraud they're trying to thwart. Most of our research shows that smart-card technologies are not something banks are willing to invest in," Moore said.

Wetherington disagreed. "We've had a number of discussions with banks, and the level of interest is high. I believe there would be a tremendous savings in fraud," she said.

Wetherington said banks would be able to add the smart cards while protecting their ATM investments by using upgrade kits that include smart-card readers. Meanwhile, AT&T and NCR are developing next-generation ATMs to support the use of smart cards.

According to Wetherington, AT&T has not yet determined the costs of the cards. She added that the AT&T unit is negotiating an electronic-toll collection contract at an undisclosed location in the U.S. Wetherington would not disclose the agency involved.

However, the New York State Thruway Association is reportedly considering bids for a statewide electronic-toll project on the state roadway, according to John Diebold, chairman of The Diebold Institute for Public Policies Studies, Inc., a nonprofit foundation in Bedford Hills, N.Y.



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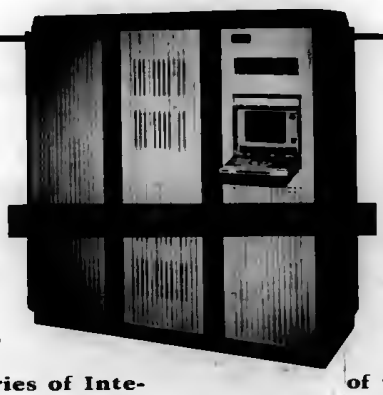
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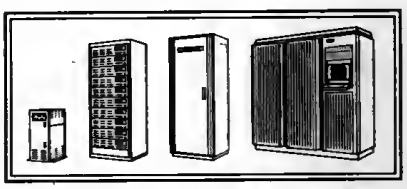
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ERS. PAGES AHEAD.

Tech Talk

Finger function is patented

A Digital Equipment Corp. researcher earlier this month patented a way to control a computer by pointing a finger — sans keyboard or mouse — at the screen. The system uses a vision system and a video camera to detect the position of the user's hand and orient a cursor on the computer monitor accordingly. The inventor was quoted recently as saying he developed his finger-pointing system because he become frustrated about continuously loosing his mouse beneath papers on his desk.

Designing atom-size widgets

Nanotechnology, the fledging science that envisions factories and devices constructed out of individual atoms, recently took a tiny step forward with a software program that designs and tests simulated molecular gears and bearings. The program, which was written by a research and development specialist at Xerox Corp. in Palo Alto, Calif., has already simulated the function of a few molecule-size components — such as a bearing made ont of two rings of carbon atoms.

Vision breakthrough

Claiming a significant breakthrough in computer vision systems, the David Sarnoff Research Center earlier this month announced a patent and a commercial business for its real-time Smart Sensing system. The technology reportedly combines object recognition, motion tracking, image compression and fusion and optical character recognition. in addition, it places most of the advanced vision functions on a single chip. The Princeton, N.J.-based Sarnoff Center also announced the formation of Sensar, Inc. — its first spin-off company — to commercialize the technology.

More than just a model

Future object-oriented models could become actual systems

By Christopher Lindquist

GAMES THAT ALLOW YOU TO PLAY God and model life, such as Maxxis' SimCity, quickly illustrate how complex an environment can be to create and keep running.

However, for all their complexity, such games can be extremely useful for describing and simulating reality. And the advent of object-oriented technologies foreshadows a day when the model will cease to be merely a representation of a new system and will actually become the new system.

Would such a tool be beneficial to an information systems manager trying to re-engineer or reorganize systems within a company? Scientific and Engineering Software, Inc. (SES) hopes so.

The Austin, Texas-based company makes a product called SES/Workbench, a graphical tool that allows users to model systems — computer, manufacturing or human — and experiment with those models to discover optimum solutions for re-engineering problems.

Users graphically lay out a process on the screen using 24 icons with predefined behaviors. The details behind those behaviors, such as the amount of time customers spend in a line waiting for food or the amount of time a database query requires to be processed, can then be adjusted, both to model reality and to test possible improvements.

The flexibility of the system lies in the fact that "the processes described don't commit you to a given technology," said Reza Seddigh, senior applications engineer at SES. "Once you get the performance numbers, you can decide what your technology should be."

Key Van Behnia, a member of the technical staff at Pacific Bell, said his company is impressed enough with SES' system that it will try to use it in re-engineering and specification gathering projects next year.

Pacific Bell has used the SES/Workbench on several projects, including one that simulated systems distribution on a variety of platforms. "SES is extremely powerful in representing the problem to a very, very low level of detail," Behnia said.



Michael Socias

SES/Workbench has been used to model environments ranging from the instruction set of a microprocessor to the queuing theory behind a fast-food restaurant's serving lines

However, there lies the drawback. Simulation can only be as good as the input data, and "oversimulating," or trying to simulate too much, can bog users down in unnecessary details. It may also show them some important details they missed.

"We're still working at the same level of abstraction we did 35 years ago," contends Jim Browne, professor of computer science at the University of Texas at Austin and chief scientist at SES. Browne, who has developed several visual programming systems, describes the need for a paradigm shift in the way software is constructed and used.

Brown also takes a dim view of trying to update Fortran and other older software languages. "We're designing additions to languages that are already obsolete, and I think we're wasting our effort."

As an example, Victor DeGragnano, regional sales manager at SES, described a scenario in which a user wants to back up a hard drive as quickly as possible, so he buys the fastest tape backup unit on the market. But his system is incapable of transferring data as quickly as the drive can take it, so the drive ends up stopping and starting — and running very slowly.

A properly designed model could have predicted such behavior and told the user to buy a slower tape backup unit or upgrade his system.

Is this a simple-minded example solvable with a little common sense? Maybe, but taken to the nth degree, such simple problems can soon become overwhelming.

To help keep the simulations from becoming overwhelming as well, SES/Workbench allows the user to animate the system. In essence, this allows the user to see information or a product as it flows through the environment and to visually note bottlenecks or problem areas. Graphs at individual nodes indicate whether a segment of a process is being over- or underused.

For example, a database server that receives requests faster than it can process them would be indicated by an ever-increasing graph — a sign that something is awry.

The product costs $37,000 for a single-user entry system, plus the cost of Unix hardware. The technical level of the user must be quite high, according to SES. Pacific Bell uses teams of programmers, modelers and "domain analysts" — specialists in a particular functional area — to develop the models with SES/Workbench.

Moreover, the system's output is still just a model. If you want to rebuild your systems to match the model, you have to do that on your own.

Yet this may not be the case in years to come.

As object-oriented code becomes widespread in the corporate world, the potential exists for an object-oriented model that, when modified, actually creates a new system. According to Natasha Krol, vice president and service director for advanced information management strategies at Meta Group, Inc. in Burlingame, Calif., "At this point, these tools are separate from the development. You have to model it, then you have to build it."

Any company working with an object-oriented strategy is implicitly working toward the ability to implement a model-as-system environment, Krol added.

When the link that allows this becomes available, the ability for systems to be put together and modified quickly should increase dramatically.

Then systems managers may get the chance, finally, to play God with their systems.



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Hot potato(e)

I am sure each of you can relate to this scene, which you have likely reenacted with your own kids if you have any.

You're young and sitting at the dinner table, heaping your plate to the ceiling. After a few mouthfuls, lo and behold, you're stuffed. Predictably, either your mom or dad says, "Your eyes are bigger than your stomach."

Thus it seems with a growing number of user departments when it comes to digesting the local-area networks they've been piling into their departments in recent years as part of their plan to empower the end user. "We'll do it ourselves," the department heads said, "and we'll buy them with our own money so we'll get what we want, not what IS tells us to buy."

But a funny thing happened on the way to independence. Those damned LANs just don't plug and play the way users thought they would. In fact, some users are finding they are as much or even more support-intensive than the big clunky systems of old.



Not only that, but LAN technology is evolving so quickly, who can keep up?

It is not surprising, therefore, to see stories appearing in network publications that testify to the information systems department's re-emerging influence on LAN purchase and implementation issues. For many user departments, this movement is going to be a rude awakening to the cold, hard light of dawn in the world of LAN support.

To begin with, it is very expensive. Users naively believed that the bulk of LAN expenditures ended with the purchase of a server, a LAN operating system, some wires and some software. Costs of training, upgrades, ongoing support and LAN interoperability were given lip service. Now the bills are coming due, and the users are in shock.

Also, the IS departments of yesterday had 25% or more staff than they do today. They cannot hide any support costs in elaborate staffing webs — all costs will be charged back. But at least there will be better orchestration of LAN deployment in those companies where IS is brought back into the picture.

This re-empowerment of IS — albeit perhaps reluctant re-empowerment, when you consider some of the messes IS will inherit — happens in all sorts of places. Even Microsoft, the power-to-the-user undisputed king of the desktop, rethought its strategy to have user departments provide PC support; responsibility was transferred back to the central IS staff. This was done for the same reason Microsoft uses some mainframes, among other things, to run the company: It is the best solution.

So yes, the reports are true. User departments are swallowing their pride (rather than choking on costs) and seeking help from IS to manage distributed computing strategies. Now we'll see what happens when the user departments start clamoring for multimedia and other expensive toys on the technology horizon.

Bill Laberis

Bill Laberis, *Editor in chief*



New design takes the stand

Those in favor...

Your efforts to downsize or right-size or whatever it's called,
Have not been without peril; you've emerged battered but not mauled.

The new format is great, the paper is slick,
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Gail von Huene
Triadigm International

Those not in favor...

I have two comments on the latest issue. First of all, is the new "upgraded paper stock" recycled and recyclable? If it is not recyclable, you are taking a giant step backward in today's environment.

Secondly, I always liked the "old" Executive Briefing inside the front cover until you changed it. The center and right columns are now hard to scan because you switched to a smaller type size, eliminated a lot of white space and included more details about each article. Make the Executive Briefing more "brief," and it will be much more useful.

Charles Berg
Mankato, Minn.

Upon receiving my Nov. 16 issue of *Computerworld*, the first thing that I noticed was not the new layout but the paper. Instead of the newsprint previously used, *Computerworld* is now printed on slick magazine-style paper, which you called a "higher quality paper stock."

Perhaps, but the slick paper cannot be easily recycled, and now, instead of being able to recycle my old issues of *Computerworld*, I'll have to throw them in the trash, which will take up more landfill space.

On a slightly different but related topic, I was glad to see that *Computerworld* is now using Unix-based client/server technology.

Michael A. Chance
St. Louis

I know that I am advancing in years, but *Computerworld*'s new format with its compression and smaller type is terrible! Are you sending magnifying glasses to your subscribers?

Frank Lesh
Princeton, N.J.

I don't care for your new type font, which is aesthetically attractive but harder to read than the former one.

I particularly don't care for your new paper. First, because it now reflects light more than the newsprint did, which makes it harder to read in brightly lit areas.

More importantly, this new paper can't be recycled like "plain old" newsprint could. This, I see, is a step backward.

Ted Koppel
Norcross, Ga.

Split decision

First, a comment on your new format, which I like. I prefer the smaller size, and I like the new typeface.

However, I hope that your new upgraded paper includes some recycled paper. It concerns me that a magazine of your size, printed every week, may not use any recycled paper.

As a consumer, I am increasingly concerned about recycling, and I make many of my purchasing choices based on this issue. If you aren't using recycled paper, I hope you are actively considering doing so.

Stella K. Crowe
Flint, Mich.

I like the new size, new columnists and management section. I dislike the new typeface, which is hard to read, and the new paper, which produces more glare from lights.

Michael J. Peters
Minneapolis

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Product mania needs a reality check

M. Arthur Gillis

For the past two or three years, we've beeo experiencing weaknesses in most sectors of the computer indostry. Some experts blame the economy. That's only part of it. My answer is, "Enough already."

I'm not against progress or improvements in information technology, but some parts of the IS business have matured, and things work well enough to leave them alone. The problem is that even though vendors like to brag about solutions, the industry is still product-oriented. And what's worse, many corporate IS managers are just as product-oriented.

Smart users of computer technology will know how to balance legitimate need with supply in order to get the job done and not go overboard. Although technical excellence is a must in our business, I believe we need excellence in judgment and common sense. Before we get a chance to wear out technology, it seems that we are eager to replace it.

And here comes the shocker: Some functions just don't need to be automated.

I'm reminded of that when I go into a small retail store that was once quick to ring up my sale. Now the store has automated, and as a result, I get a chance to read the tabloids while the system records all kinds of information about the fact that I purchased some stationery.

When the main missioo is delayed in order to favor the system or the owner of the system, I believe we have failed.

Technology companies are so desperate to keep np an uninterrupted pattern of growth that they seem to be forcing technology on functions that don't really need it.



Dave Shelton

Electronic mail is a great example. The first time E-mail approached me with its obnoxious three-beep signal to tell me someone was trying to interrupt my deep concentration, I decided I didn't need that kind of intrusion.

I want a geotler and kinder communications system. I'd rather suffer a paper cut from opening an envelope than be beeped.

Hindrance rather than help

I know we've got problems in this husiness because there are lawyers, engineers and consultants in my office building who frequently knock on my door in desperation. "Can you help me with my system?" they beg. They have a job to do, and their system is blocking them for a variety of reasons. Then I pick up the trade journals and almost everything I read involves new technologies and leading-edge products. It's like telling a user who can't produce an aged accounts receivable report that his computer uses the most advanced chip technology. Will that make him feel any better?

I sometimes believe the business of technology and the business of people are out of sync. It is as if we built a super automobile that can travel at speeds of 200 miles per hour on 60 miles per gallon, but we don't have the highways or the drivers to take advantage of such power. And even if we did, there are still some very nice people who will not want to drive that fast.

We've done a great job of producing superb technology. What we haven't done well is to place it at the right levels and make it work at all levels of user activity. Some of it is too complex for ordindry workers, and some of it is too threatening to executives. And some of it changes so fast that IS seems to be engaged more in upgrading technology than in processing applications.



Enough technology already. Let's get some work done.

Gillis has been a consultant to more than 200 financial institutions and has written 13 books and manuals on IS. This piece is adapted from his latest book, *Sorry, Our Computers are Down* (Vantage Press, 1992).

E-mail: The commercialization of time?

OPEN MIND *by* Esther Dyson

Last mooth, Gary Becker won the Nobel Prize in economics for explaining how people — consciously or not — base their their personal behavior on economic principles in spheres such as getting married, entering or leaving the work force, pursuing higher education or committing crimes. Like it or oot, economics guides our lives.

People like to think there are some oobler parts of life that are secure from the rational calculations of economics. But that has never really been the case.

It's true that, until a few hundred years ago, most people didn't deal with money at all. They worked on farms for landlords who took care of them. They built their own houses, sewed their own clothes and maybe traded a few goods for other goods. Yet of course they were making economic decisions all the time: Eat the corn or plant it for next year. Raise the child or send him off to work in the city as an indentured servant. Get married or take the boat to America. And so on.

In our own century we've seen the commercialization of child care and many household chores. The next territory to be assaulted by commercialization will be communications, courtesy of E-mail.

E-mail is still outside the market, but not for loog.

How we handle phone calls now is s precursor of how we'll handle E-mail, but E-mail will make the decision-making routines more explicit and automatic. We have informal schemes to handle phone calls — just as farmers had informal ways to value a lamb against a pair of shoes.

Some calls you return right away; some you respond to if the caller calls again. Some you refer to Fred in marketing; some you handle yourself. Explicitly or not, you're making decisions about the value of your time measured against other people's needs — and against what you may hope to get from them in return.

Fair enough. That's life in the corporate jungle. But E-mail will make all this more visible.

Suddenly, instead of making these decisions ad hoc, you'll have to make them beforehand — because the volume of decisions will go up. It's OK to trade s pair of shoes for a lamb once, but if you're trading shoes every day you need to establish s price. In the same way, E-mail will enable you to be deluged with requests, informatioo and other messages and will force you to devise a "pricing" system to handle them.

That system won't be instructions to your secretary, bot a set of filtering rules that sorts your mail and handles most of it automatically. At home, you may even set up pay-me schemes: Instead of receiving the magazine for free because of all the advertisements it contains, you'll have to pay for it because advertisers know that you can screen out their unwanted messages (shades of the television ad zapper and the rise of paid-for cable TV).

But you may also "volunteer" (sell) your time: Anyone who wants to send me ads can do so for $2 per screen. Or perhaps I'm buying a car. Anyone can send me car ads for free for a limited period only.

Yes, it may sound grungy. But it's a reflection of the power technology gives us to interact with a broader world; at some point, we'll have to classify those interactions explicitly in order to handle the volume of interactions technology makes possible.



Or you can just unplug your computer's modem and live outside the market. It's your choice.

Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets, respectively, in Eastern Europe.


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Charles Babcock

Seize the network

Ask any parent: Maturity isn't achieved without pain. Network managers know that — they are now facing the most painful stages of juvenile awkwardness as LANs move toward maturity.

Often created by end users for their own purposes — and without reference to requirements beyond their own departments — LANs often are uncommunicative things, difficult to connect to the corporate network and expensive to manage.

This situation has been a trial for those in IS who bear responsibility for compnting infrastructure, so it is good news that Novell is trying to get the PC and NetWare to outgrow their adolescence and join the extended computing family. Don't start celebrating just yet, though. It isn't necessarily going to be an easy passage.

The vehicle Novell intends to use to accomplish this transformation is NetWare Version 4.0, which it will officially annonnce in early 1993. This won't be an operating system for amateurs. Unlike earlier versions of NetWare, which were often installed by guerrilla end users in defiance of IS, Version 4.0 will require professional evaluation of applications to see if they have been written by Novell's rules. If they have, they can be recompiled to run under 4.0. If not, you're in for a much longer, harder haul.

And the fact is that many NetWare applications weren't written by the rules. Many took advantage of NetWare's ability to run in unprotected memory and make direct calls to hardware address space. Although this practice yielded performance advantages, it will no longer be allowed in Version 4.0. So dirty hooks will have to be cleaned out, and those portions of the application will have to be rewritten and recompiled for Version 4.0, a Novell spokesman said.

So how extensive a problem is that? Enough of one that it will slow the conversions to Version 4.0. It is common knowledge that application developers at Novell often used dirty hooks, so it is likely they are widespread in the customer base.



Nevertheless, if NetWare LAN administrators can get past this hurdle, there is much in Version 4.0 to make for better LANs — grown-up features such as directory services and security.

Version 4.0 will depart from NetWare's server-centric, bindery-constrained existence. Until now, the NetWare LAN was focused on a server, which meant a user had to log on separately to every server containing data he needed. If you didn't know where the data was located, you were out of luck because the NetWare bindery was a flat file of system resources and users. To get beyond it, you had to be able to name and log on to a different server.

Version 4.0's Directory Services, on the other hand, will function much like a distributed database management system. Users can be added to NetWare locally, and a designated central point or points will be informed and will keep track globally.

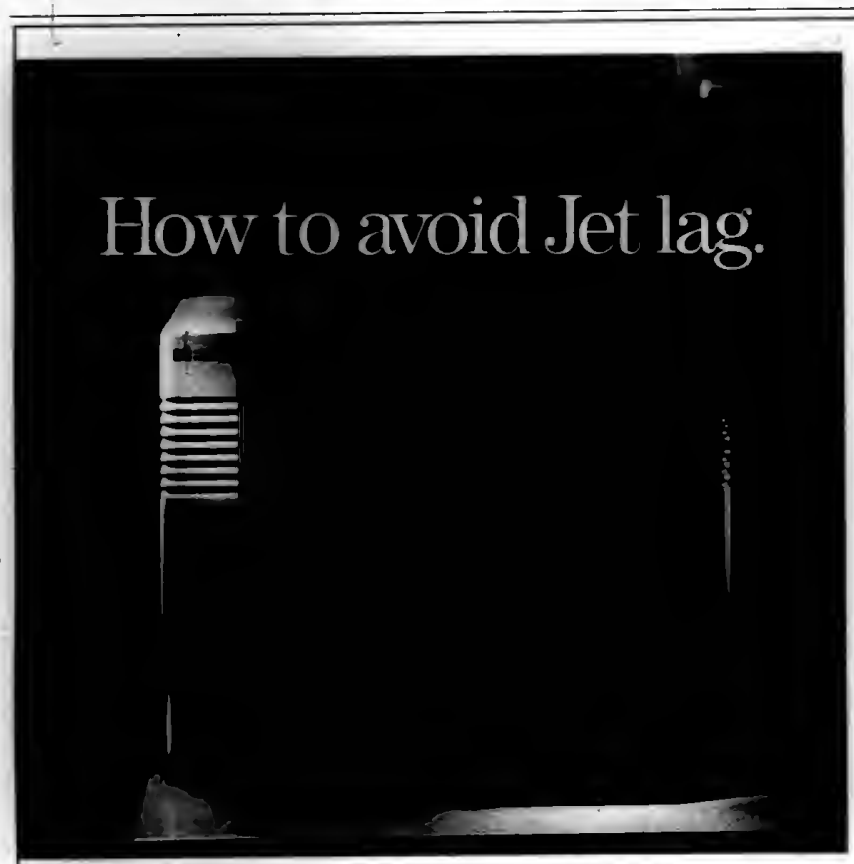
By the time of tbe 4.0 announcement, Novell expects to have graphical administration ntilities to help set up the network. These will be followed by NetWare Management Services to allow management of the network in a graphical environment.

Equally important, the number of nsers allowed per NetWare network will reportedly rise from 256 to 500 or 1,000, and messaging will be internationalized in that recipients will receive messages in their native languages.

Such breaks from LAN constraints are critical to stemming rising network administration and management costs, as networks spread across workgroups and departments and connect to the WAN.

What was good a few years ago for the impromptu workgroup of PC users isn't good enough now. Novell has no choice but to go down this path to 4.0, and network administrators will have little choice but to seize the day and create larger, better integrated LANs, despite the difficulties.

Babcock is *Computerworld*'s technical editor.



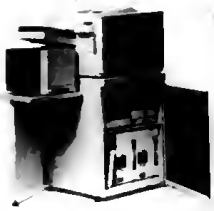
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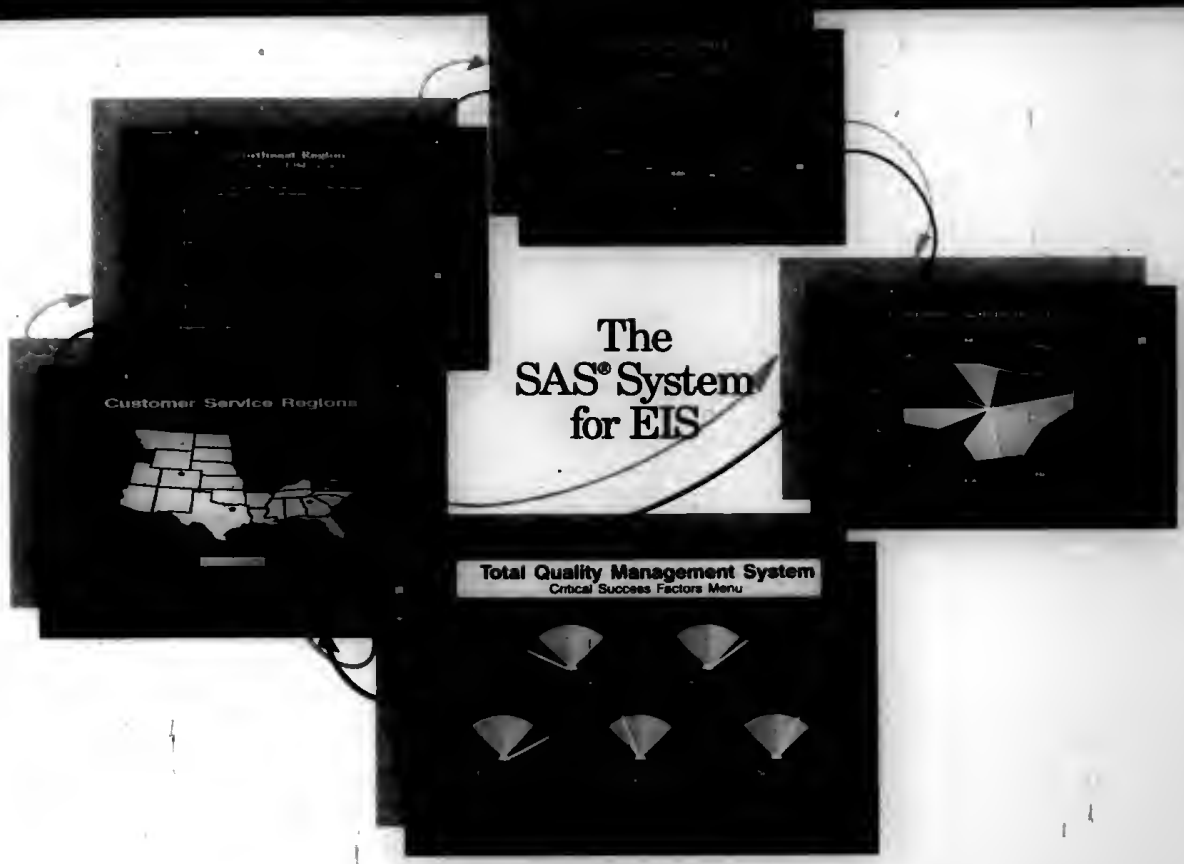
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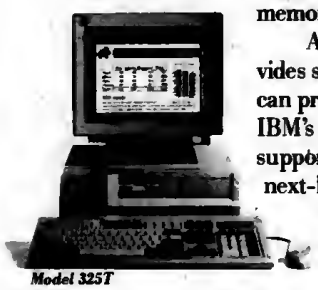
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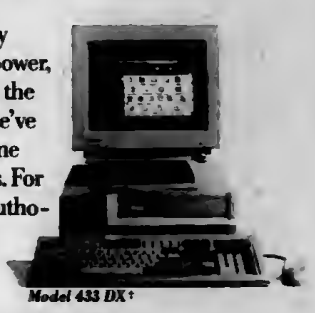
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Processor	386 SLC™/25 MHz	486 SX/25 MHz (Upgradable)	486 DX/33 MHz (Upgradable)
Monitor	PS/2® 8511-VGA††	PS/ValuePoint 6312 SVGA	PS/ValuePoint 6312 SVGA
Memory/Storage	2MB RAM 80MB HD	8MB RAM 80MB HD	8MB RAM 120MB HD
Pre-installed Operating System	DOS 5.0	OS/2® 2.0	OS/2 2.0
Price†††	$1,299	$1,629	$1,999

††325T is SVGA-capable †††IBM prices, dealer prices may vary

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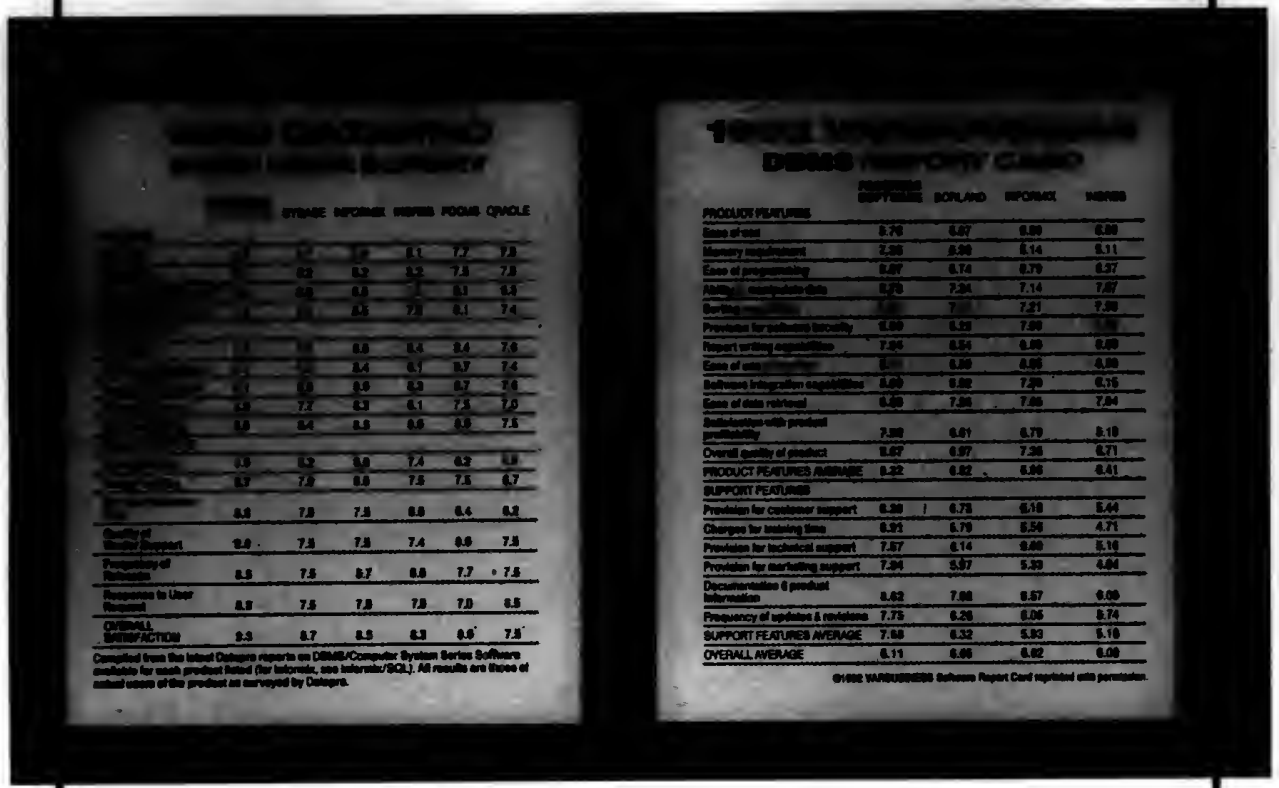


Model 433 DX†

*Next-business-day response when serviced by IBM or IBM Authorized Personal Systems Services. Available Monday-Friday 8 a.m. to 5 p.m. in your time zone. Warranty and 30-day guarantee information available from IBM and IBM authorized dealers. **In Canada, call 1 800 465-7999. IBM OS/2 and PS/2 are registered trademarks and PS/ValuePoint, SLC, HelpWare and HelpCenter are trademarks of International Business Machines Corporation. Novell is a registered trademark of Novell Corp. The Intel Inside Logo is a trademark of Intel Corporation. © 1992 IBM Corp.

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PRODUCT FEATURES				
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Memory requirement	7.56	8.00	8.14	8.11
Ease of programming	8.67	8.14	8.29	8.57
ASCII - complete data	8.75	7.25	7.14	7.67
Sorting	8.00	7.00	7.21	7.00
Provision for validation/security	8.00	8.29	7.00	7.00
Report writing capabilities	7.56	8.14	8.00	8.00
Ease of data dictionary	8.00	8.00	8.00	8.00
Software integration capabilities	8.00	8.00	7.29	8.15
Ease of data retrieval	8.00	7.86	7.00	7.84
Satisfaction with product profitability	7.50	8.01	8.79	8.10
Overall quality of product	8.67	8.57	7.36	8.71
PRODUCT FEATURES AVERAGE	8.22	8.02	8.00	8.41
SUPPORT FEATURES				
Provision for customer support	8.38	8.75	8.10	8.44
Charges for training time	8.91	8.79	8.56	4.71
Provision for technical support	7.57	8.14	8.00	8.10
Provision for marketing support	7.94	8.57	8.33	4.84
Documentation & product information	8.62	7.88	8.57	8.00
Frequency of updates & revisions	7.75	8.26	8.06	8.74
SUPPORT FEATURES AVERAGE	7.68	8.32	8.03	8.10
OVERALL AVERAGE	8.11	8.05	8.02	8.00

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CPWADV1214

White Paper



Sales Force Automation

Now Available On DOS, Macintosh And Windows.



These days, it takes more than a hat full of tricks to boost sales.

A customized sales force automation system for the way you sell today. And tomorrow.

Selling just isn't what it used to be.

More than ever, today's sales professional must do more in less time. It's a real balancing art. And nobody understands this better than GE Information Services.

The proof is our Sales Marketing Communication System (SMCS). It's a complete customized package of easy-to-use productivity tools such as territory management, lead tracking, order entry, forecasting, call reporting, electronic mail and much more. Our hands-on support team will help you implement and use the tools that are right for you. And because SMCS integrates with most existing systems, there's no worry about loss of investment.

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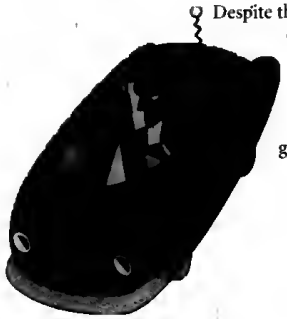
Introduction

It is somewhat surprising to find that sales departments, which directly account for the revenues that drive so many companies, are among the last to receive enabling information technologies. Perhaps it is because sales men and women are often able to tap their own internal resources in times of need.

No mater how talented these indivuduals may be, however, they can improve their performance through the use of Sales Force Automation (SFA). SFA, which includes automated sales support and the integration of sales data with other corporate information, is taking advantage of current computing trends, such as open systems, group collaboration and portable computing, to keep sales people better informed then ever.

Portable computing, in particular, is a bulwark of SFA. Although the bulk and weight of earlier models discouraged all but the most slavish devotees, newer versions — most notably notebook computers — conveniently lend themselves to the requirements of mobile sales forces.

In fact, sales managers interviewed by IDC claim that the new generation of notebooks is enabling them to set unprecedented strategies for the widespread integration of automation.



Despite the gains, however, SFA is still struggling to overcome poor market awareness, general apathy and lack of technical sophistication. The first of these three problems is rapidly improving. Apathy is also giving way as organizations increasingly realize the competitive edge they can gain by empowering their sales forces with SFA.

This White Paper was written independently of the Computerworld *editorial department by Clare Gillan, manager of the Applications and Information Access Program with IDC.*

For more information on the White Paper Program, please call 508-879-0700.

MOTEL



The convergence of economic issues and technological advancements is moving the sales function into the IS limelight. In the wake of this convergence, automated sales support and the integration of sales data with other corporate information — Sales Force Automation (SFA) — have become necessary tools for many companies.

Other tools — lightweight portable computers, intuitive graphical user interfaces, open access to heterogeneous data, and advances in communication technology — are all stimulating broad demand for SFA applications considered too complicated for previous technologies.

Despite this demand, however, sales has been one of the least automated areas in business. That is finally changing as tough economic conditions force companies to reduce costs, optimize resources and improve quality and service. Now companies are turning their attention not

only to sales, but also to related functions such as customer service.

The benefits of a properly implemented sales system go well beyond increasing a sales person's productivity. Sales data is critical to the decision-making process at all organizational levels, from the executive making corporate decisions to the sales representative canvassing a territory.

To date, few companies have successfully implemented comprehensive SFA systems. IDC attributes this low activity to a lack of resources, awareness and know-how among many prospective users. Over the next two to three years that will change as radical advancements are made in technology aimed at improving sales productivity and the quality of customer relationships.

KEY FEATURES OF SFA

SFA encompasses technologies tailored to the sales function, in particular, providing field sales people the necessary automated tools to increase their productivity. Attributes of SFA include territory management, e.g., a customer database, electronic calendar/tickler files, integrated word processing with mail-merge capability, and reporting. More advanced systems may support sales forecasting, two-way communication between the field and group offices, links to external and corporate data, and a high level of reporting and analysis.

The most valuable SFA systems do more than increase the productivity of the individual sales person. The truly influencial SFA systems integrate with corporate information systems and facilitate the flow of information across sales and related functions such as marketing or customer service.

ENTERPRISE INTEGRATION

The currently emerging generation of business applications is best referred to as "enterprise integration." The dominant trend of this generation is the act of bringing information and people together. Applications facilitate communication among people and the integration of disparate information located in corporate, departmental and personal databases. Key technologies enabling this movement include:

• Open systems - Open systems promote the deployment of SQL-based applications, data access middleware for access to heterogeneous databases and hardware platforms, and Unix for platform portability.

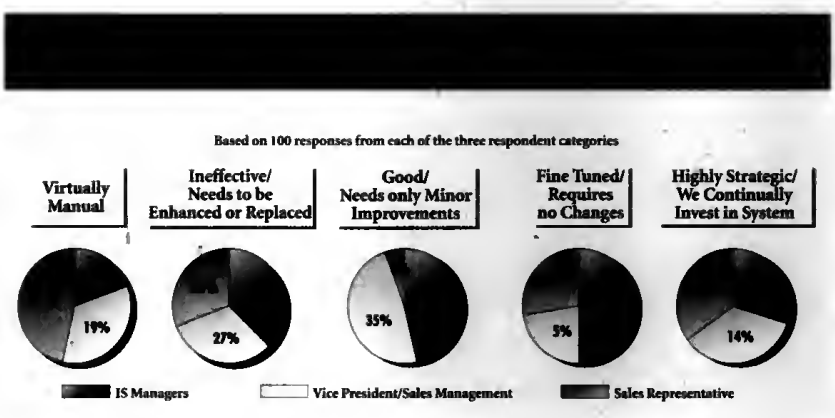
• Group collaboration - Group collaboration is characterized by integrated office systems — in particular electronic mail — for communicating and coordinating with others; groupware applications like Lotus Notes, which allows people to share hard and soft information: and workflow applications that optimize processes involving multiple people.

• Distributed information - Critical characteristics of this category include client-server technologies, LANs, WANs and portable computers. Wireless communications, allowing access to remote computers without a modem, will also become important as its costs drop.

Sales organizations stand to benefit from these technologies, particularly in companies that embrace the concept of team selling. A recent IDC study indicates that 73% of IS managers at large organizations consider sales to be an integrated part of their corporate IT user community.

THE CURRENT STATUS OF SFA

There are three primary stumbling blocks to SFA: poor market awareness, apathy and a lack of sophisticated technology. Poor market awareness is a problem despite the fact that nearly 100 U.S. vendors provide SFA packages. Unfortunately, the majority of these vendors are small companies that lack marketing muscle. Since active market demand is often a function of marketing

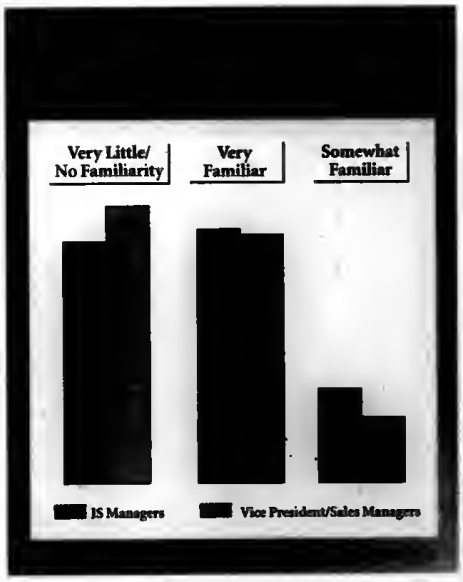


Source: International Data Corp

dollars spent, corporate focus on SFA has been relatively low.

Lack of interest in this application came partly from the fact that the 1980s was a good decade for business in general. So long as the sales function met its quotas, increasing sales productivity was not a broad market issue. Other business issues, such as controlling inventory overhead and more quickly informing management on its previous month's performance, took precedence.

Perhaps the biggest deterrent to SFA was the lack of sophisticated technology. Only recently have the necessary tools successful SFA implementations require become available. These technologies include lightweight and affordable portable computers, such as Apple's Macintosh Powerbook, intuitive graphical user interfaces and flexible integrated applications. More companies are using them as they attempt to utilize every possible weapon in their competitive arsenals.



SFA ACTIVITY AMONG U.S. COMPANIES

IDC recently interviewed 100 large U.S. companies (5,000 or more employees) regarding their use of sales technology. The participants were senior IS people, vice presidents and senior managers of sales operations and sales people — the three groups generally involved in successful SFA projects.

More than half of the companies consider themselves to be somewhere between "efficient" and "bleeding edge" when asked how they apply IT toward increasing performance and competiveness. IDC estimates that less than 15% of sales-support systems are highly strategic, i.e., instrumental in helping the sales organization and the overall corporation meet or set objectives.

Seventy-five percent of the surveyed companies are in manufacturing; the balance are spread across other non-government, non-educatioo industries. Sixty-six percent of the sales forces are centrally organized, while the others operate on a distributed structure. Fifty percent of the companies rely completely on direct sales people. Anolher 35% claims more than 40% of their staff focuses on direct sales. Twenty-seven percent have less than 10 sales people, while 38% have more than 10 but less than 50. Only 12 sites have more than 500.

Most large companies support their sales effort with some level of computerized technology. These sales support systems vary in sophistication. Some are composed of a single terminal located in the sales area. This terminal is used to send sales data to a corporate database or a PC in the sales manager's office. It may run a spreadsheet, calculate commission, adjust quotas or forecast sales activity. Although these systems are used io the sales area, their back-office focus and limited integration with a sales strategy strongly reduce their effectiveness.

Investment io SFA is picking up. Forty eight percent of the IS managers interviewed report that they are actively improving automation in the sales area; another 34% are in the planning stages. IDC attributes this increased SFA activity to a reversal of the three previously negative factors holding SFA in check: poor market awareness, apathy and the lack of sophisticated technology.

PORTABLE COMPUTING

Portable computing is one the strongest drivers of current SFA activity. Clearly, the bulk and weight of first-generation portables deterred their use in SFA. Even now, despite the advances made in portable computer technology, about 35% of sales organizations in large companies still do not have any portable computers. Of those that do, portables are only used by about one-third of the sales representatives and managers.

This is changing as the allure of portables grows while prices and sizes shrink. Consider Apple's Mac Portable: In August 1991, it sold at an average street price of $3,170 and included 2M bytes of RAM, a 40M byte hard drive and 16 MHz clock speed. The Mac portables have since been succeeded by Apple's Powerbook line of notebook computers. Today the top-of-the-line Powerbook 180 weighs just 6.8 pounds, comes with 4M bytes of RAM, up to a 120M byte hard drive, a 33 MHz processor, and sells for an average street price of $3,595.

Although the price gap between desktop computers and portable computers has not disappeared, it is shrinking to the point where it is no longer an automatic impediment for companies that are serious about automating field sales.

The hard way.



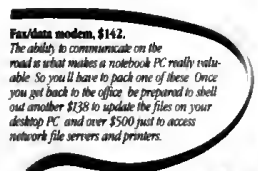
New programs, $506 each. *Unless you buy programs specifically designed for Windows 3.1, you'll have to use conventional character based programs and their awkward commands.*



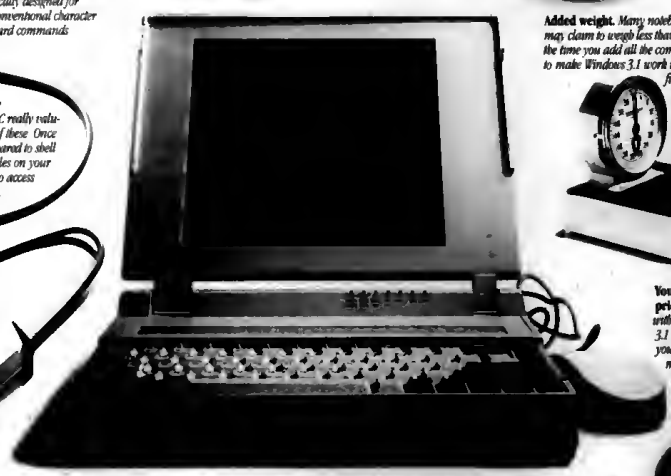
Extra memory, $210.* *Most notebook computers on use today simply aren't fast enough to make Windows 3.1 practical. And many that are fast enough may require extra memory, which can add hundreds of dollars to their price tags.*



Clip-on trackball, $172. *If you're going to try to use Windows 3.1 on many portable computers, you may have to plug this in and clip it onto the side of your computer. (Be careful not to catch the cord in your airplane tray.)*



Fax/data modem, $142. *The ability to communicate on the road is what makes a notebook PC really valuable. So you'll have to pack one of these. Once you get back to the office, be prepared to shell out another $138 to update the files on your desktop PC, and over $500 just to access network file servers and printers.*



Added weight. *Many notebook computers may claim to weigh less than 7 pounds, but by the time you add all the components you need to make Windows 3.1 work well, you're likely to find yourself with an additional 4 or 5 pounds to lug around.*

Your time, name your price. *Fiddling around with MS-DOS or Windows 3.1 on the road can cost you plenty of time. How much is yours worth?*



Ordinary notebook, $2,497. *The typical notebook computer of today was designed to run DOS only, not Windows 3.1. It doesn't have enough memory, speed or screen brightness, and its screen isn't fast enough for high-quality graphical computing.*



Comfort *is something most notebook computer ads never talk about. Because, truth is, they're not very comfortable to use. Which may explain why they don't win awards for being well designed. (PowerBook, of course, has won more design awards than all other notebook computers combined.)*





Instruction manual, 2 pounds. *There's nothing like forgetting a DOS command when you're 2,000 miles from home, so you may want to carry a manual with you. And since Windows 3.1 is based on DOS, you'll definitely want instructions handy.*

The couch seat factor. *If you want to run Windows 3.1 on most portable computers, you'll find that you need a front mounted keyboard and a side-mounted trackball or mouse. What you won't find is enough room on an airplane tray to hold it all.*

If you're looking for a notebook computer that's easy to

*The prices and all the prices noted here reflect average Manufacturer's Suggested Retail Prices. **Comparisons are based on a 1991 independent research study conducted by Ingram Laboratories that tested a variety of personal computers running applications available for both the Macintosh and Microsoft Windows 3.0 registered trademark and Windows is a trademark of Microsoft Corporation. Usr2 is a registered trademark of International Business Machines Corporation. SoftPC is a registered trademark of Insignia Solutions Inc. WordPerfect is a registered trademark of WordPerfect Corporation. This ad was created using Macintosh computers.*

The easy way.

Consistent applications. *Every PowerBook runs thousands of Macintosh programs (including Lotus 1-2-3 and WordPerfect) that all work in the same consistent intuitive way. You learn one, you know the basics of all of them.*

Blistering speed. *Because Apple® Macintosh® computers are optimized for graphical computing, PowerBook® can significantly outperform comparably priced notebook computers running Windows.™*

Built-in Balloon Help.™ *Point at what you want to know about, and your Macintosh will tell you what it's for. So you can leave your manual in a desk drawer at home.*

Built-in networking. *Plug your PowerBook into an AppleTalk® network and conveniently access all network resources—printers, file servers, e-mail, even other networks from Novell, IBM and Digital.*



AppleTalk Remote Access. *This remarkable software is an option with every Macintosh PowerBook. It not only allows you to access all the files on a modem-equipped Macintosh at your office or at home, it also gives you complete access to your network—printers, files, file servers, e-mail—from anywhere there's a phone.*

Built-in fax/data modem. *With this option, you can send your work directly to a fax machine or access e-mail from almost any telephone anywhere you happen to be. Just plug the phone cord into the back of the PowerBook.*

Built-in file sharing. *On most notebook computers, sharing information with a desktop computer is virtually impossible. But every PowerBook has powerful file sharing built in. So you can easily connect your PowerBook to a desktop Mac® or another PowerBook and copy files from one computer to the other.*

Built-in peripheral support. *Like every Macintosh, PowerBook lets you add up to six external hard drives, CD-ROM drives, scanners or other peripherals simply by plugging them in.*

Built-in sales. *The ease of Macintosh makes PowerBook the ideal tool for salespeople on the road. For information on how you can automate your sales force, call 800-635-9550, ext. 125. We'll send you our free brochure* Macintosh in Sales.

Palm rests. *Working on the road isn't like working at your desk. So Apple designers provided a place to rest your hands, making it much easier and more comfortable to work in tight quarters—such as a middle seat on an airplane.*

Integrated trackball. *Everything about Macintosh computers is designed to make it easy for you to work. In the case of PowerBook, the pointing device is integrated into the computer. There's nothing to hook up or clip on. Open it up and you're ready to go. (It's comfortable whether you're left- or right-handed, too.)*

It's compatible. *Like every Macintosh, PowerBook is compatible with the personal computers you use at the office. It can read from and write to floppy disks from MS-DOS or OS/2 PCs, or even run DOS software using programs such as SoftPC.*

use, there are basically only two ways you can go.

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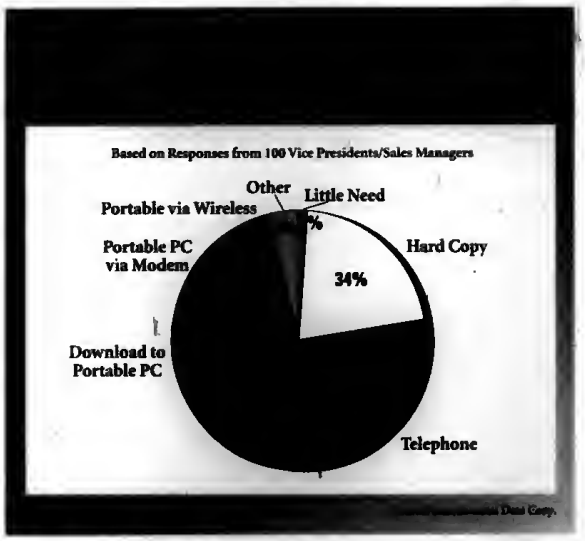
THE VIRTUAL OFFICE

Enthusiasm will spread as laggard companies come up against competitors armed with a "virtual office," which is essentially a portable computer equipped with all the information and function a sales representative needs inside or ontside the office. For example, portables in the SFA environment hold all customer account information, order forms, pricing information, electronic sales presentations and electronic mail access. A modem allows the representative to download or interact with information from the home office. A modem and facsimile software enable the representative to use any available facsimile machine as a substitute for the printer. However, portable printers are available from a number of vendors.

This virtual office concept allows sales reps to function on a sales call as efficiently as if all their prospects had come to their office. Ultimately, such a properly planned and implemented system will generate more and higher quality sales calls. The virtual office implies corporate integration, but corporate integration requires a large investment of hard and soft (time and resources) dollars. There are less expensive, unintegrated approaches, but they may be insufficient when applied to a highly competitive situation.

IDC asked sales reps about their views of portable computers as a sales support tool. Forty-five percent indicate that portables only enhance sales performance if they are part of an automated and integrated sales automation effort. Integration becomes particularly important in a team selling environment. Notably, 40% agree that even using portables as personal tools supporting daily sales-related activities would contribute to increased performance.

Many companies choose to start at this personal level. However, it is important that they do not get caught in a dead-end strategy. As the system grows, back-end data servers and integration with other corporate information become more important. Portable computer users must adapt to such changes.



REMOTE ACCESS TO CORPORATE INFORMATION

Not suprisingly, most reps still use the telephone to access sales-related information located back at the office. This practice will decrease dramatically over the next few years. Seventy percent of the sales managers report to IDC that their reps access this information by telephone today. The second most common data access method is downloading via on-line portable computer communication. Within three years, this method will be number one. With technology such as AppleTalk Remote Access, users can act as end nodes on the network no matter what their location, whether at home or via cellular connection. Printouts are now the third most popular information access method.

While SFA vendors frequently compete against internal development, they also run up against more general packaged business applications that offer sales-automation capabilities. Examples of non-sales-specific solutions include spreadsheets, word processors and Personal Information Managers (PIMs).

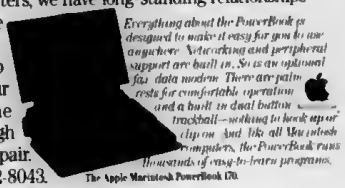
SFA vendors have begun to realize that the opportunity lies not in competing with generalized solutions, but in leveraging them. For instance, more mature SFA solutions initially included a proprietary word processor and a proprietary electronic mail capability, largely because de facto application standards had not yet emerged.

Since that time, many of these SFA packages have been altered, allowing users to integrate popular word processing and electronic mail products such as Microsoft Word, WordPerfect and Lotus's cc:Mail. Leveraging third-party technology allows SFA vendors to be more focused on the value-added features, such as optimizing profit margins and coordinating workflow in team selling environments.

SFA software vendors continue to evangelize the market. About 40% of IS and sales managers report that they are being consistently contacted by vendors about SFA solutions. Another 20% report that they have been contacted by a small number of vendors, but that these vendors called infrequently. Despite the various contacts between users and vendors, more than 40% of IS and sales

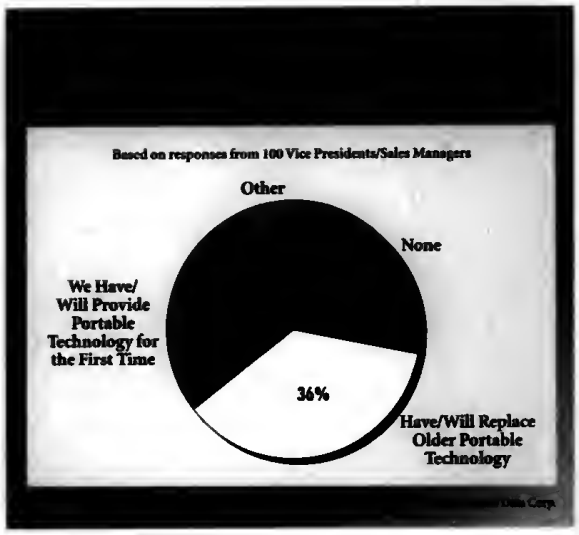


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managers indicate they have little or no familiarity with the range of available SFA solutions.

APPLICATION WISH LIST

IDC asked each of three groups (IS, sales management, and sales representatives) to identify the three areas of sales they would most like to automate if their management gave them a blank check. IS says it would focus on sales analysis and remote access to corporate data. Sales management and sales reps agree that account management would be their number one investment.When asked what area they would automate last, all three groups indicate telemarketing. Customer presentations and external database access also rank low. The importance of customer presentations could increase now with the advent of multimedia capability on notebooks such as the Apple Powerbook.

INTEGRATION WITH OTHER INFORMATION

The newfound emphasis on team selling, particularly among companies selling ioto large accounts, is boosting SFA. Team compositions vary. For instance, the team might be composed of multiple sales people, or a sales executive and a technical engineer. It may also involve people from various parts of the company, i.e., customer service, marketing, engineering and sales. Whether or not team selling has been formalized in a given company, iotegrating the sales information system with other information systems not only benefits the overall organization, but also enables individual reps to simulate the sbared-knowledge environment offered by team selling.

Today, more than 75% of SFA systems in large companies are integrated with order processing and general accounting systems. Seventy percent of these large-company SFA systems are integrated with customer service. IS, sales management and sales reps all agree that order processing, customer service and price/specification data are the three most important areas for SFA integration.

Frequently, companies do not consider what areas besides sales can benefit from sales data. For instance, executive information systems provide senior management easy access to critical business information from a variety of data sources. Sales information should be included io the mix. Although financial data is the most common source of information, sales and marketing data are also vitally important.

It is interesting to compare views on how IS management, sales management and sales reps view the automation level of their current sales system. IDC ioterviewed representatives from all three groups across 30 companies to find out. Ten percent of IS management feels their sales support system is manual compared with 23% of sales management and 30% of sales reps. By comparison, 17% of IS report that the sales support system is highly strategic, compared with 13% of sales management and 7% of sales reps. Most people, regardless of group, report that their system requires some level of improvement. Only a handful of people report full satisfaction.

INFLUENCERS AND DECISION MAKERS

Just who drives an SFA project? Vendors report that the initiators range from an individual sales person to IS vice presidents, noting that the sales manager is typically the most influential. IS management, sales management and field sales people agree that IS, marketing management and sales managemeot are tbe most active SFA decision makers.

Senior corporate management generally observes SFA projects without intervening. The IDC-interviewed groups all agree that the actual users of the SFA system are more involved in the selection, design and implementation processes than the CEO. Despite this, CEOs generally sign off on these expensive projects.

In smaller companies, or even in smaller-scale implementations, the decision-making roles may change. For instaoce, in a smaller company, a sales manager or senior sales rep may be able to drive an SFA project from beginning to end. It should be noted that these projects are relatively simple, often using off-the-shelf single user software.

Storage Technology Tightens Up With SFA

The Company

Storage Technology is a $1.5 billion manufacturer and supplier of storage systems to computer manufacturers. The firm describes its selling style as "relationship selling." Sales cycles often take up to one year, requiring an average of 50 on-site sales calls. It has about 200 field sales people in North America and more than 85% of its sales volume is direct.

The Mission

"Apollo" was the name given to the Sales Force Automation (SFA) system developed by John Williams and Tom Campbell. Williams, vice president of North American field operations, conceived of the system and Campbell was made project manager in February 1991. He was given eight months to have the system up and running. This aggressive deadline was driven by Storage Technology's anticipated launch of a major new product line.

Hardware and Software Selection

Prior to this project, the sales force had limited exposure to computer automation. Campbell involved the regional sales support managers and one sales rep from each of six regions in evaluating alternatives. They agreed that portable computers — notebook computers in particular — were a necessary component.

Before committing to a specific notebook configuration, Campbell and his team investigated a variety of off-the-shelf SFA software solutions. They concluded that, considering the cost of packaged software and the specific functions they desired, it would be better to design and build their own single-user system. They also saw this as a way to increase their strategic advantage, because it would make their system more difficult to duplicate.

The company evaluated a number of notebook computers during a period preceding the introduction of Apple Computer's Powerbook notebook model. Under terms of non-disclosure, Apple representatives described Powerbook to Storage Technology's SFA project team. Based on that presentation, Campbell and his team selected the Powerbook. They were particularly attracted to the quick prototyping software facilities that would enable them to deliver a highly functional and easy-to-use application within four months.

The team selected Fourth Dimension, a Macintosh-compatible database application, as the software development platform for their custom application. Microsoft Office was chosen to provide integrated word processing, spreadsheet and presentation graphics. The storage systems company selected an external messaging service as an interim solution for remote communications and electronic mail.

Consulting Assistance

Storage Technology commissioned Andersen Consulting to develop the functional design specifications and data conversion plans, handle project management and training materials, and the actual training. The objective was to have each rep's portable equipped with all necessary information upon delivery. Metropolis Software Inc., an experienced Fourth Dimension developer, provided most of the technical leadership and programming for the custom application.

Production System Launch

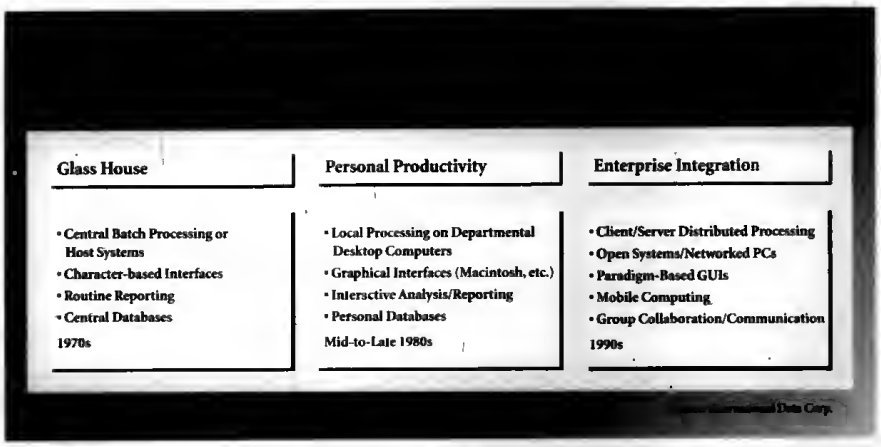
The system went live in November 1991. Each sales rep received two full days of training and a notebook equipped with a broad suite of applications. Applications included territory management, calendaring, account information, pricing configuration, communications and a proposal generator. All data could be stored locally or in corporate data bases. Product descriptions and competitive comparisons were also scanned and downloaded to the portables.

Campbell estimates that about 95% of the sales force currently uses Apollo. Some use it casually, others heavily. The casual users tend to be older sales reps who have established their accounts and territory, as well as a refined style of account management. The more aggressive users tend to be the less experienced reps who are toiling to develop their territory.

Estimated Return on Investment

Storage Technology has done some preliminary analysis of how the system has affected its business. The cost of implementing the system, including development, software, hardware and training was about $1.5 million. Spread over the 200-person sales force, the cost per rep is about $7,500. Campbell estimates the system will pay for itself within eighteen months.

He also points out that, prior to implementing the SFA system, the average number of sales calls per sale was 50. As a result of the system, that number has dropped to 40. He adds that as the system is increasingly used, the number of calls will drop even further.



CONCLUSIONS

The need for SFA varies by company. The answer may be as simple as hooking sales into a corporate electronic messaging system, or as complicated as building a highly strategic sales system that integrates various departments across multi-national companies.

When making the decision whether or not to invest in sales automation, be aware of the many available alternatives. If your company has decided, or is even thinking about moving down the SFA path, consider the following "dos" and "don'ts":

• Don't underestimate the importance of ease of use. The weakest link in the system can be the one between the user and the computer.

• Begin with an effective sales strategy. Throwing technology at a dysfunctional process will only set your company back. Also, consider the sales process as it involves other departmental functions.

• Meet with a broad range of SFA software vendors. Many have gone through great pain to overcome potential SFA pitfalls. Their references will provide you with the opportunity to compare notes on SFA strategies and expectations.

• Investigate new technologies. An effective SFA system does not necessarily require bleeding edge technology. However, as when making any IT investment, beware of dead-end technologies — such as those that may lock you into a single-user approach — as well as the obsolete (transportable computers). Select products that receive healthy and regular investments by the manufacturer or provider.

• Leave room to grow. In addition to considering current and future needs in the sales organization, consider how the use of the system may change. Take into account central IS issues even if rolling out independent systems, thus allowing potential integration down the road. Avoid the trap of outgrowing your first SFA investment.

• Don't alienate potential users or supporters. Despite the potential benefits of SFA, some may perceive it as a prying Big Brother. Interview users extensively not only to find out what will excite them but also to make them feel like contributors, not victims, of the process.

• Don't encourage abandoning unique selling styles in favor of generic system prescriptions. Customization should be considered at the sales organization and at the personal level. The system should complement rather than inhibit a rep's style of selling.

• Stay in touch. View the SFA implementation as an evolution, not a revolution. Let the users know you care. Check back with them after several months of usage.

• Invest in the system continually. Sales people will pay more attention to a system that receives regular attention than one that is established and forgotten. Sending out regular notices regarding system enhancements and training classes can be a passive, yet effective, way to encourage system usage. Furthermore, as the system is used, leave open the possibility of incorporating new needs or suggestions.

The SFA evolution is underway. Becoming SFA-aware is an inexpensive first step for companies that have not fully extended computer automation to the sales function. This simply requires understanding the potential benefits of SFA and how the various alternatives might apply to your sales organization. If nothing else, becoming SFA-aware will help to prevent competitors from taking your company by surprise.

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OLE 2.0 awaits applications, tools

By Christopher Lindquist

■ The newest version of Microsoft Corp.'s Object Linking and Embedding (OLE) spells out the direction for future operating systems from the Redmond, Wash., software vendor.

It may be a while before corporations see any significant benefit, however. OLE is not easy to implement, and the use of many of its features will be dependent on software vendors producing applications and development tools for OLE 2.0, which recently went into beta testing. Microsoft said it hopes that such third-party products appear shortly after OLE 2.0's expected mid-1993 production ship date.

OLE is defined by Microsoft as a set of services that allow users to create compound documents consisting of information from multiple applications. For example, using OLE, a "sound object" could be embedded in a word processing document for voice annotation.

There is a hurdle, however. OLE 2.0 applications are not simple to develop, Microsoft acknowledged. "[Implementing] OLE 2.0 is a lot of work," said Cameron Myhrvold, director of developer relations at Microsoft's Systems Software Division. "We fear a little bit that people will look at OLE 2.0 and say, 'Gosh, this is hard.'"

As a result, he said, corporations that do not want to dedicate large amounts of time to hard-core Windows programming probably do not foresee themselves taking full advantage of OLE 2.0 until higher level integration tools ship. Such tools will be able to take advantage of OLE 2.0's ability to have applications register a command set that can be used by other applications, making very tight integration of dissimilar applications possible without having to rewrite the programs themselves. The first OLE 2.0 integration tools should be available when — or shortly after — OLE 2.0 ships in midyear 1993.

On the surface, OLE 2.0 offers such features as in-place activation of objects rather than requiring a separate window to be opened, and drag and drop of objects among applications and into other objects. But OLE 2.0 also makes some changes to the roots of OLE that may prove even more important. Indeed, OLE 2.0 starts to define the object-oriented model that will form a major part of Microsoft's far-future object-oriented operating system, code-named Cairo.

"Elements of OLE 2.0 become part of the native system in Cairo," said Dave Seres, product manager for the OLE and Interoperability Group at Microsoft.

Such an object-oriented approach will be important to Microsoft in the future, said Walt Johnson, senior research analyst at New Science Associates, Inc. in Belmont, Calif. The biggest advantage to such an object-oriented structure is flexibility, which he said Microsoft will need if it is to reach its goal of having Windows on everything from telephones to supercomputers. Microsoft's stated strategy for Windows is to have scalable Windows systems ranging from modular Windows on consumer products to Windows NT and Cairo on multiprocessor superservers for mission-critical applications.

Here's what's new

Among the new features in OLE 2.0 are the following:

- Objects that can be edited in place with only an application's menus appearing, rather than opening a separate window.
- Objects that can be nested inside one another.
- Dragging and dropping of objects among applications is supported.
- Storage-independent links that will allow objects within documents to update each other regardless of whether the object is stored in the computer's file system.
- Object links that are updated automatically whenever source or linked objects are copied to new locations.
- Objects that can contain version and conversion information, allowing programmers to work with objects created with different versions of the same program or allowing them to convert objects from one application format to another.

Workgroups seen as wave of the future

By James Daly

Mom always said it was nice to share. But in the 1990s sharing may be a business necessity.

That is the conclusion of a white paper recently released by Taligent, Inc., which surveyed hundreds of information systems professionals in a quest to determine what factors will drive the IS initiatives of the next decade.

The report revealed a strong orientation toward cross-functional workgroups, especially in geographically dispersed companies. As re-engineering gains momentum and global work-load balancing becomes imperative, the leaner and flatter organization will depend heavily on workgroup collaboration and seamless information exchange, said Joe Gillach, manager of market development, who helped conduct the study.

Taligent said it chose to share the information so the industry can slow its internecine sniping and focus on creating a more user-oriented, collaborative vision of the future. Taligent, a joint venture between IBM and Apple Computer, Inc., said its research found there is a need for object-oriented technology, which is Taligent's core interest.

During the study, nearly 300 people, from senior executives to entry-level employees, were interviewed from Bechtel Corp., The Boeing Co., Bristol-Myers Squibb Co., Brooklyn Union Gas Co., Citibank NA, Clorox Co., Esprit de Corp, Marriott Corp., MCI Communications Corp., Procter & Gamble Co., The Travelers Corp. and Union Pacific Railroad. Gillach said these companies were targeted because of their track records as innovators.

Basic needs

The interviewees were initially asked what propels their desire for increased collaboration. Leading the pack were the two central tenets that drive the business world: Reduce costs and increase growth.

Another catalyst for change is the fact that in a tight economy, customers can no longer be taken for granted. The result is a new emphasis on customer service.

Businesses are also increasingly taking a worldview. With domestic markets becoming saturated, many are already making operations and systems investments to support globalization, Gillach noted.

How are they going to achieve these goals? By empowering the end user. Winning strategies include the increased use of graphical user interfaces, data access tools, visual development environments and groupware products. End users will then climb the self-sufficiency curve, from addressing day-to-day reporting requests to tailoring applications, the study reported.

Some collaborative techniques deemed critical to success include agent- and knowledge-based systems, which will help users better navigate the growing volumes of enterprise data, Gillach said.

Techniques such as imaging and graphics were also underlined as key parts of data sharing. Boeing, for instance, relied heavily on such techniques in the creation of its 777 aircraft, which employed design teams in the U.S., Japan and Europe that continually shared visuals, Gillach said.

Unfortunately, cultural roadblocks often stand in the way of the collaborative process. Some interviewees identified a generation gap among senior managers, who may not view technology as a competitive weapon, and younger professionals, who grew up with the technology and are committed to it.

OS/2 PC network meets medical center's needs

By Rosemary Cafasso

TULSA, OSLA

A year ago, Hillcrest Medical Center looked at its information systems effort and the 20-year-old applications it was maintaining and knew there had to be a better way.

Today, the 500-bed community hospital is in the thick of a downsizing project that will move the bulk of its patient management and administration applications from outdated IBM 4300 mainframes to a network of IBM OS/2-based PCs. Hillcrest expects to go live with the first module, which manages patient registration and admitting, in March 1993.

But the hospital got on the downsizing bandwagon in a roundabout way. It had initially been shopping for a laboratory management replacement system when it came across a tiny software development and services company in Rancho Cordova, Calif., called 3Net Systems, Inc.

3Net demonstrated the lab system for Hillcrest, and in subsequent conversations "the idea began to germinate that we had something

Medical center, *page 60*

ON SITE

Hillcrest Medical Center
Tulsa, Okla.

Challenge: To clone a set of mainframe-based applications for a PC-LAN platform.

Technology: IBM OS/2; Novell, Inc. local-area network; 3Net Systems, Inc. application development tools.

Goal: To save $10 million in five years by removing mainframe upkeep costs.

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Most IT professionals tell me they would prefer to work with a strong network integrator rather than buying from many independent product suppliers. And yet, they buy bridges, routers, adapter cards, smart hubs and network management, etc., from dozens of suppliers. Why? Because they equate picking an integrator with having to settle for second rate technology. The only way out is to buy networks in pieces and shoulder the nasty job of integration alone. Time-out! At Ungermann-Bass, we don't think choosing between the "Best of Breed" and "One Stop Shopping" is a choice you should have to make. That's why we're the first networking company to combine leading edge products with leading edge integration. At Ungermann-Bass, network integration is just as important as technology. Now you can have the "Best of Breed" from a single source. If your company would benefit from a business partner who is as obsessed with the performance of your network as it is with product innovation, call Ungermann-Bass at 1-800-777-4LAN.

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Your global network integration partner

Don't forget to put software on your list

By Christopher Lindquist and Derek Slater

It is Thursday, Dec. 24. Someone is pushing that little button in the back of your mind that makes you think you forgot to do something. What could it be?

Not to panic. Here are a few suggestions for Christmas gifts that have floated across our desks recently and should be available at your local computer store.

The Ancient Art of War in the Skies
Micro Prose Software, Inc.
(800) 879-7529
Price: $59.95

Whether you prefer masterminding the strategic World War I defenses of France or jockeying a Sopwith Camel to blast the Red Baron out of the sky, The Ancient Art of War in the Skies is just the ticket. The Ancient Art puts you in the commander's chair in a variety of World War I battle scenarios; you can jump in and out of dogfights and bombing runs as you guide the strategies of the Allied or Central Powers forces.

It is easy to start playing right out of the box, without much reference to the manual (though the documentation, a primer on World War I history and battle tactics, is an interesting read anyway).

Unfortunately, in the heat of the battle the graphics-oriented game may outrun your hardware; on a 386 clone, the graphics occasionally got bung up and the cursor seemed to develop a will of its own.

The Mouse Arena
Formtnco
(800) 663-6764
Price: $29.95

Mouse pads, in general, have some problems. The surfaces sometimes do not grip the mouse ball firmly enough; they get dirty quickly; and we have had a couple begin to come apart after only a couple months of use. Perhaps you know someone in this same situation. Then maybe it is time to get The Mouse Arena.

OK, so the name is a little bokey. The product is not. The Mouse Arena consists of a circular pad with a "Tyron" work surface that provides enough friction for smooth mouse movement but does not build up dirt or "mouse fuzz" easily.

In addition, the Arena has an adjustable leather palm support and a cord holder that keeps the mouse cord out of the way. Seven rubber feet keep the Arena from migrating off your desk.



Star Trek: The Screen Saver
Berkeley Systems, Inc.
(510) 540-5535
Price: $59.95

Star Trek just keeps on wheezing along, and now comes Berkeley Systems, the After Dark screen saver company, to breathe some more life into it.

Star Trek: The Screen Saver provides more than a dozen Star Trek (the original, not The Next Generation) themes for preventing screen burn-in on your monitor. True, monitors do not have the burn-in problems that they used to, but these screen savers are simply fun to watch.

Whether the screen is filling up with tribbles or Mr. Spock is roaming around exterminating aliens, Star Trek fans are sure to be pleased with the authenticity of the product.

Out of this World
Interplay Productions
(714) 545-9001
Price: $59.95

Every once in a while a product comes on the market that redefines what is an acceptable level of quality. Out of this World has done that for us in the action/adventure game category. You play Lester Knight Chaykin, a scientist sent to another dimension via an experiment that goes awry (via the ever popular lightning-strikes-just-at-the-critical-moment scenario).

The graphics quality is outstanding, despite the apparent use of only 16 colors to help speed the game. The graphics, sound and storytelling combine with mind-bending puzzles to create one of the more exciting games we have ever played. There are times when you truly feel you are watching, and taking part in, a movie. It is well worth the price of admission.

Links386
Access Software
(800) 800-4880
Price: $69.95

If golf is your game, Links386 is the way to go if you have the hardware for it. Links386, as the name implies, requires a 386 or better processor and at least a couple of megabytes of memory, though the more the better. You will also need at least 13M bytes of free disk space. The benefit behind this hardware hunger is that the digitized 256-color graphics and sound are spectacular on the right machine.

Medical center picks OS/2 PCs

CONTINUED FROM PAGE 57

here at Hillcrest that could be migrated to the PC LAN environment," said John Cooper, administrative director in charge of information services.

Hillcrest and 3Net eventually struck a deal: 3Net would assist the hospital in downsizing its core applications for the OS/2 platform. In addition, it would train Hillcrest's small programming staff — long-time mainframe Cobol developers — to use Compose-It, 3Net's application development tool. Compose-It, a prototyping and applications generator tool, completed about 70% to 85% of the code. 3Net also agreed to write the remaining code in C++ to complete the software.

In return, 3Net will remarket the software applications to other hospitals when completed.

Everybody wins

"It could be a win-win for both Hillcrest and 3Net," Cooper said. "They will have a product to market, and we get downsized."

Cooper did not provide financial details on the deal. However, he said he expects Hillcrest to save up to $11 million in the downsizing project over the next five years from lost mainframe maintenance and upkeep costs.

The project was officially under way in March. Cooper was hesitant to say when he expects the conversion to be finished.

"What we have on the mainframe is a result of 20 years of history," Cooper said. "Exactly when all this will be migrated, we can't say for sure."

Sandra Brewer, a programmer analyst, said that while the new application development tool has taken some getting used to, it has been a smooth transition. "We had a two-week training period, and after that, we were fairly comfortable with the product. We were slow at it at first, but we were able to do the work," she said.

Brewer said the prototyping feature is new territory, but it has delivered a big boost to her programming efforts. "It's helpful because you can develop a screen rapidly and see how it will work," Brewer added.

"With the mainframe, you'd spend a lot more time before you could get the screen designed."

HELP LINE



WordPerfect for DOS

Part of a collection of user tips provided by vendors and drawn from questions asked of their customer support groups. This week's tips deal with WordPerfect Corp.'s 5.1 for DOS

Q. How do you set up labels in WordPerfect 5.1, and what do you do when you receive error messages that say the label margins are increased or the labels will not fit?

A. In the May 31, 1991 interim release of WordPerfect, a new LABELS.WPM macro was included with the program. This macro was enhanced to include more label sizes and makes adding and deleting label definitions easier. The macro also displays a list of label sizes and stock numbers. To run the macro, press Alt-F10 and type labels.

In addition to the LABELS.WPM macro, the Format: Page menu (Shift-F8, P) has been enhanced to include a labels Paper Size/Type if one has been selected.

Q. Why does WordPerfect present the message, "Are other copies of WordPerfect currently running?"

A. WordPerfect creates temporary files each time the program is started, which are deleted each time the program is properly exited.

However, if a power failure, computer lockup or improper exit occurs, e.g., turning off the computer before pressing Exit (F7), the temporary files will still exist the next time the customer starts WordPerfect.

The message asks if other copies of WordPerfect are currently running so that if other copies are running (such as on a network) and the customer answers "Yes" to the message, the existing temporary files will not be deleted and a directory can be specified where the new temporary files can be created.

If the customer answers "No" to the message, then customers are given the option to Rename or Delete existing backup files that were created by the Timed Backup option — Setup (Shift-F1), Environment (3), Backup Options (1), Timed Document Backup (1).

Q. What can you do when horizontal text does not fit on one complete screen and you must scroll from left to right to read the screen?

A. This problem is most often caused when a small or proportional font is selected.

One temporary workaround this problem is to choose a Courier 10 pitch font for text editing and then change the font for the final formatting. (This solution would not work for a customer who is using tabular columns and plans on selecting another final font.)

Q. Why is it that when you try to select a landscape font, no landscape fonts appear on the list of base fonts?

A. A landscape Paper Size/Type code must be selected before you will see landscape fonts on the list of base fonts.

Software application packages

Great Valley Products, Inc. has introduced ImageFX.

The product joins traditional elements of image processing and editing with high-end special effects to achieve professional results on any Commodore Business Machines, Inc. Amiga computer.

The software has 24-bit image manipulation features for image creation, editing and retouching. ImageFX also has morphing capabilities for cinematic quality output and includes image processing tools for color correction and manipulation.

New modules may be added to support scanners, printers, frame grabbers and display devices.

An external "hook" program provides virtually unlimited expansion possibilities, the company reported.

ImageFX costs $369.

➤ *Great Valley Products*
600 Clark Ave.
King of Prussia, Pa. 19406
(215) 337-8770

Computer Associates International, Inc. has announced Version 2.0 of ACCPAC Simply Accounting for Windows.

According to the company, the product takes advantage of Microsoft Corp.'s Windows Data Exchange, enabling users to transfer data to other Windows programs. Instead of going through multiple journals, Version 2.0 has the ability to permit cash purchases or cash sales to be entered as single transactions. Key enhancements include flexible transaction handling and enhanced forms handling.

The product costs $199.

➤ *Computer Associates International*
1 Computer Associates Plaza
Islandia, N.Y. 11788
(516) 342-5224

Macintosh products

Timeslips Corp. has introduced LapTrack, a software program designed for the Apple Computer, Inc. Macintosh.

LapTrack is an application that automates time and expense tracking for productivity analysis reporting and client management purposes, the company reported. Users can track time and expenses and budgeted figures vs. actual figures.

Billable or nonbillable time spent can be tracked when the product is used on a portable, and with networked Macintoshes, time and expense records can be gathered from employees into a central multiuser database. LapTrack also has the ability to create analysis reports of time and expense data.

LapTrack costs $79.95.

➤ *Timeslips*
239 Western Ave.
Essex, Mass. 01929
(508) 768-6100

Blueridge Technologies has announced Optix 4.0, an Apple Computer, Inc. Macintosh-based software package for archival and retrieval of document images and all nonimage files.

The product's features include a flexible indexing database to archive and retrieve images, fast compression and decompression and image annotations. Support for high-speed printers, scanners and optical disc drives is also provided.

Version 4.0 enhancements include savable queries, processing queues, the ability to cut and paste thumbnails in documents and enhanced support for text files. New features to support optional optical character recognition and text search have been added.

A single-user copy of Optix 4.0 costs $695.

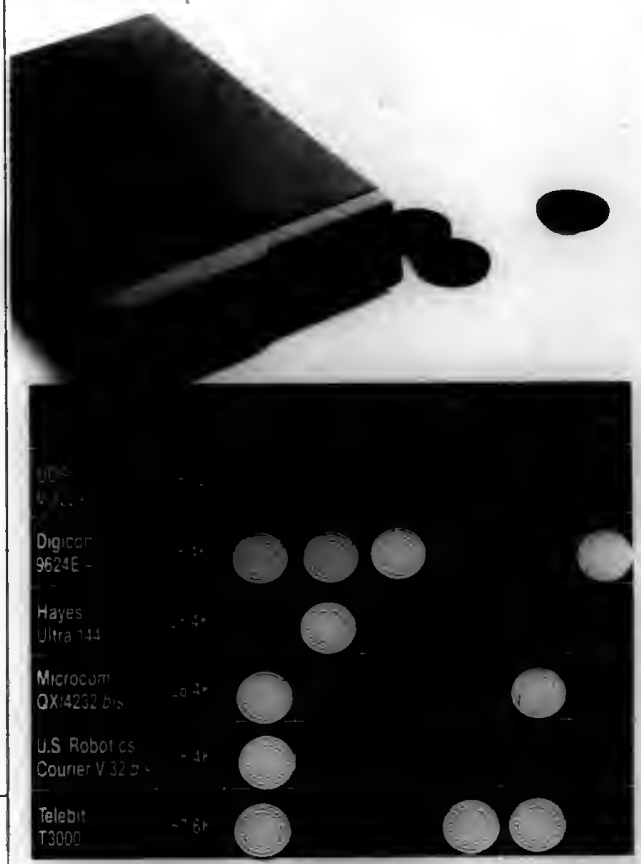
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UDS brings more to the table in the V.32 *bis* modem game



Modems that comply with the CCITT V.32 *bis* recommendation (and there are lots of them) share some common characteristics: 14.4 kbps basic rate, with compressible automatic fallback speeds; V.42 *bis* and MNP® level 5 data compression; sync or async full-duplex operation over two- or four-wire circuits and Hayes "AT" auto-dialing.

As these similarities drive value-conscious modem buyers to look beyond the common features, the search for added performance advantages brings them to the UDS V.3229.

In addition to the "standards," UDS offers a suite of features—automatic dial back-up, remote configuration capability, call security etc.—that is simply not available in competitive models.

If you're a modem buyer who understands that there's more to value than just price, UDS will happily rig the V.32 *bis* game in your favor.

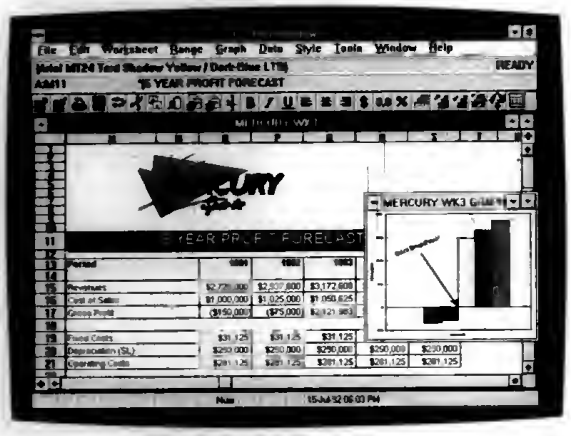
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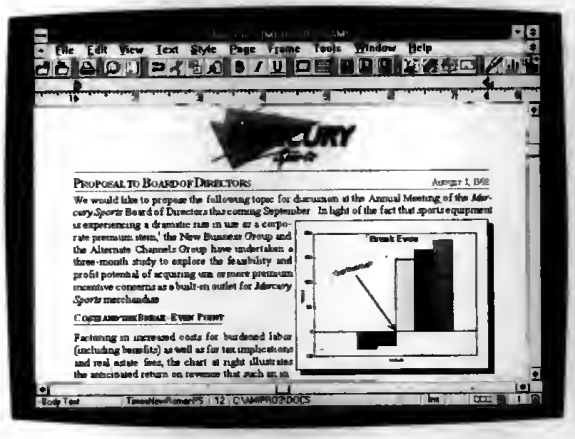
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Compared to Lo
Microsoft Office look



1-2-3 for Windows Release 1.1 now includes over 25 new features and usability enhancements.

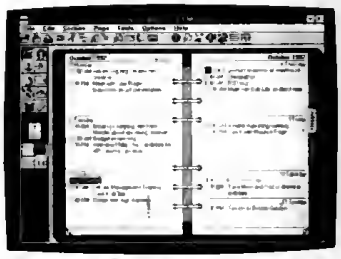


Ami Pro 3.0 includes new features that make it more powerful and easier to use than Microsoft Word for Windows.

It's true. When you evaluate our complete solution for Windows® desktops and then look at theirs, you'll see why ours is a better business choice.

Of course, both SmartSuite® and Microsoft® Office include full-featured products. But SmartSuite has been recently updated to include 1-2-3® for Windows Release 1.1 with SmartPak™ and the newly released Ami Pro® 3.0, as well as Freelance Graphics® and cc:Mail®.

All four of these award-winning products share a common interface as well as our innovative SmartIcons.® So when you've learned one, you've learned them all.

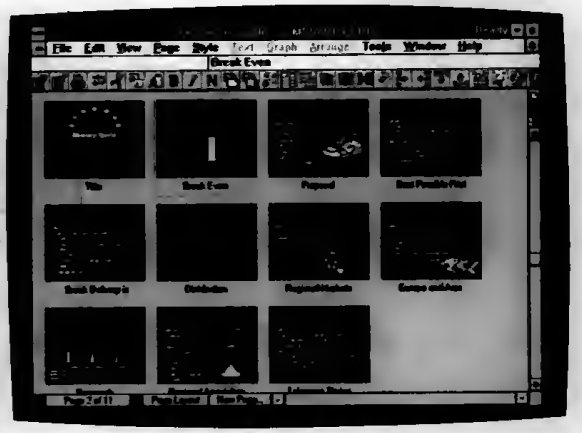


For a limited time, SmartSuite includes Lotus Organizer, the computerized way to keep tabs on all your daily tasks.

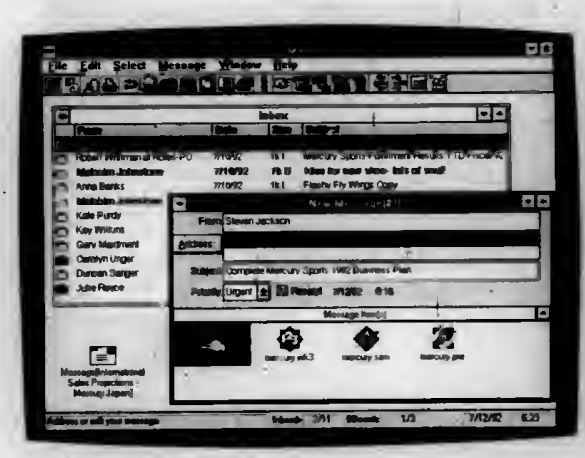
What's more, SmartSuite delivers some truly unique integration capabilities that aren't possible with Office. All four SmartSuite products, for example, share data, text and graphs between each application smoothly and seamlessly. So when an outline produced in Ami Pro is imported to Freelance Graphics, it's automatically converted into a Freelance Graphics outline and full-slide presentation. And a 1-2-3 graph exported to Freelance Graphics will arrive, fully editable. Not so with Excel and PowerPoint. You can even move

*Offer expires 12/31/92 or while supplies last. **Suggested retail value. ***In Canada, call **1-800-GO-LOTUS**. When you purchase 10 SmartSuite packages, you'll get a free cc:Mail for Windows Platform Pack (a $495 value).
SmartMasters and Working Together are trademarks of Lotus Development Corporation. cc:Mail is a trademark of cc:Mail, Incorporated, a wholly

tus SmartSuite, s more like a cubicle.



Award-winning Freelance Graphics is the easiest, fastest way to create a stunning presentation.



cc:Mail the world's leading LAN-based e-mail system, allows you to send documents across all major networks and computing platforms.

quickly between SmartSuite applications just by clicking the icon of the application you want to open.

Better still, all SmartSuite applications are mail-enabled. So you can use cc:Mail to send "live" documents from within each application. Office, on the other hand, requires you to install and use an optional macro with Microsoft Mail 3.0.

Why is now the best time to buy Lotus SmartSuite instead of Microsoft Office?

For one thing, you just can't beat the total value. In fact, for a limited time,* **when you buy SmartSuite, we'll give you Lotus Organizer (a $149 value**) absolutely free.** It includes an on-screen calendar, to-do list, planner, address book, notepad and anniversary reminder that are all fully integrated. Plus if you're upgrading from any version of 1-2-3, Symphony, any Lotus word processor or graphics product, or cc:Mail, you'll save even more. So do the smart thing. Visit your Lotus Authorized Reseller or call **1-800-872-3387, ext. 7240*** for a free demo disk.

Lotus **SmartSuite for Windows**

1-2-3, Ami Pro, Freelance Graphics, and cc:Mail

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User Voices

At what price open systems?

Computerworld: During your company's migration to open systems, what have you found to be the hidden or unexpected costs associated with the move? How have you dealt with them?

■ **Mark Schmidt,** *vice president of information technology and communications at Wal-Mart Stores, Inc. in Bentonville, Ark.*

What is difficult today is the complexity of managing the large, distributed environment. That's an area where the standards have not yet come together for things like security and software version control.

Distributed security has yet to really coalesce into a standard the whole world agrees on. For example, Posix has a standards group working on that, while the Open Software Foundation's Distributed Computing Environment is espousing MIT's Kerberos security scheme. And DCE is clearly a de facto standard.

But there are so many compelling reasons to be using open systems today, we are not hesitating. It has meant a lot for us in terms of our ability to deliver distributed services very cost-effectively. When we need software control and version management, we write it ourselves or we hire somebody to build it. You can afford to spend $250,000 doing that if you're saving $10 million to $20 million.

As standard products come to market, we'll probably phase them in over time. A good example is what we're doing with SNA. We had a remote SNA network that we lived with for many years. Well, this year we put in a TCP/IP backbone, so we support both protocols over our network.

Essentially, all the new development is TCP/IP. But that doesn't mean we're going to throw out SNA. If you give us five or six years, however, there probably won't be very many SNA applications left.

One of the things we've been sure to do is set up to standard interfaces. We've defined those and encapsulated their associated functions so that when we finally decide to actually pull [SNA] out, all we will have to do is change those places where we've encapsulated the interfaces.

■ **Mark Factor,** *MIS director at Au Bon Pain, Inc. in Boston*

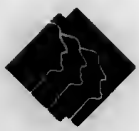
I'd say the costs are largely in the time you spend integrating products that don't work together seamlessly.

When it comes time to tie everything together, you need this series of [appropriate software] drivers and patchwork software. And sometimes the hardware gets out ahead of specific applications, which aren't thinking about all the little drivers you need to tie it all together.

For example, we were kind of excited about [Microsoft Corp.'s] Windows for Workgroups, but the drivers aren't there for Unix-oriented NFS and TCP/IP protocols.

Hidden costs can depend on [the printer compatibility of] your application packages. For instance, we're looking now at purchasing a printer for our network, and it has to be able to handle pretty massive printing.

We're looking at Compaq vs. Hewlett-Packard. Now, Compaq has just won all these awards and has a beautiful machine. They're really on the leading edge and have chosen PostScript as their default graphics format. But we've been putting everything in PCL, and HP does PCL. Also, Compaq doesn't have the drivers for Lotus applications.



In the "User Voices" column, which will appear at regular intervals in our technical sections, Computerworld shares user opinions solicited at random on a computer-related issue. This week, users spoke out on the hurdles they have faced in migrating to open systems.

■ **Alan Dickman,** *technical staff member at Bell Communications Research, Inc. in Piscataway, N.J.*

With large corporations such as Bellcore, a big cost is participating in the standards-setting process to really suit your needs. There are considerable up-front costs for the big users who want to provide input and have their influence felt. On the back end, you have some assurance it really is solving the problem for you, although the investment is somewhat speculative.

As for unexpected costs, well, administrative costs and training and support have always been expensive. And it's going to get worse as you build more and more distributed applications. But it is for that reason we're making the up-front investments in supporting standards from X/Open, the Open Software Foundation, the Network Management Forum, the Object Management Group and others.

■ **John Van Meurs,** *information systems manager at PTT Telecom in Groningen, the Netherlands*

System management is really the uncertain factor in moving to open systems. There are also concerns about having full-scale security and remote or distributed management. Those are the real needs.

The interoperability and price/performance really set people up for open systems and are benefits that are realized. What do we do? We write a lot of our own software. And yes, it's expensive.

We are making our own plans for DCE, but the initial costs are very high. DCE is part of the solution but certainly not a complete one. And the accompanying Distributed Management Environment is quite far away.

Responses compiled by senior editor Marytran Johnson. Comments have been edited slightly for clarity.

$77 884 615 605

By the end of this week Computerworld readers will have spent over $77.8 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

Microsoft's Access: Tale of two audiences

By Jean S. Bozman

Microsoft Corp.'s Access desktop database product, barely out of its shrink-wrapped package, is seen by users and analysts as a product for two audiences: end users who want to create PC local-area network databases and those who want to use it to query corporate database servers.

ISAM

Access uses an Indexed Sequential Access Method to store data, said Ross Hunter, a Microsoft program manager. But it has relational database features and uses the SQL query language associated with relational databases. Individual Access databases can run up to 128M bytes in size.

The distinction is important, analysts said, because Access' on-line Help prompts end users as they create databases, queries and report forms for use on a desktop or a PC LAN. But users need to summon information systems staffers for security clearance before tapping into corporate databases — and they may need help connecting to remote database servers.

Access can be used as a personal database, a shared database on a workgroup LAN for several users or a front end to relational database servers, such as Microsoft's SQL Server for OS/2, Oracle Corp.'s Oracle 7, Sybase, Inc.'s SQL Server and IBM's DB2.

Access' power to query relational databases is real, but users who do not know about the structure of database tables could unwittingly slow a shared database or introduce data errors. "You shouldn't give end users access to live database tables; you should give them data views," cautioned Chris Le Tocq, a senior research analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. Microsoft product managers said some companies may elect to create database extracts so users do not alter critical on-line data.

To prevent operational problems when Access is used with corporate databases, some IS managers envision a new kind of teamwork between users and corporate developers. "We will do the application for them," said John Hoffman, a systems designer at NBC's Broadcast Operations group in New York, which runs beta tests of Microsoft products. "As developers who have studied the internals of Access, we can program a script for them, and it becomes another end-user function."

In this teamwork scenario, users design their own screens but work with programmers to create queries against corporate databases. "Perhaps we need to review [the Access application] and make sure it's bulletproof," said Michael Fitzmaurice, MIS director at the National Association of Broadcasters in Washington, D.C., which has a Microsoft SQL Server for OS/2 and a Sybase NetWare Loadable Module (NLM) server in its all-PC shop. "Even seasoned developers make mistakes."

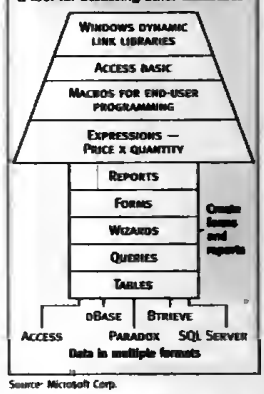
Powerful end-user tools such as Access, Borland International, Inc.'s Paradox and Gupta Corp.'s SQLWindows raise questions about the impact of client/server technology. All are capable of reaching across a network and picking data out of a data center's relational databases. "Regardless of which data access tool you're using, there is going to be some IS manager at the other end who is really ticked off that you want to touch his data," said Donald DePalma, a software analyst at Forrester Research, Inc. in Cambridge, Mass.

Another question is how to use Access in LAN workgroups. Access can read database files from Borland's Paradox and dBase, as well as from Novell, Inc.'s Btrieve database. But to do so, all PC systems hosting those databases must be left up and running even if end users are away from their desks. That could pose security problems, industry analysts said, particularly if log-in passwords are shared.

Microsoft said it is aware that many corporations have concerns about the security of corporate databases. "We have a security subsystem with lots and lots of control," responded Ross Hunter, a Microsoft program manager who ran Access "usability" tests with more than 500 people. But worried IS managers should also realize that Access will help address application backlogs, he said. "Corporate developers no longer have to deal with the fine points of designing reports," he said. "They can throw an application over the wall and allow end users to make their own reports."

Double duty

Microsoft's Access can serve as a database management system or as a tool for accessing other databases



Source: Microsoft Corp.

Performance of the Access database and application development environment may be slow if the PC hardware hosting it does not have adequate memory, Hunter cautioned. That is because underpowered machines have to write too many files to disk. He said 4M bytes of main memory is probably too little — 6M or 8M bytes would be better.

Updated releases are likely to follow in 1993, Microsoft said, including more "wizards" to automatically create database reports. Current users will get the upgrades for a small fee.

Microsoft's Access has "wizards" to automatically generate database reports, "macros" to build database queries and "cue cards" to prompt users who are building databases for the first time. Programmers can use a variant of Microsoft's Visual Basic or C for fine-tuning.



Bank to test scalable NCR imaging for check processing

By Ellis Booker
CLEVELAND

Like a handful of financial institutions around the country, National City Corp. (NCC) will use an image-enabled proof-of-deposit system in hopes of streamlining its check-processing operations.

What will make the $29 billion bank holding company's experience special will be the use of a scalable, microprocessor-based system. Other high-volume check-imaging systems — notably those from Unisys Corp. and IBM — are mainframe-based.

Last month, NCC announced the trial of NCR Corp.'s Scalable Image Item Processing System (SIIPS) as part of a strategic partnership.

"Our business case has been driven on how we can dramatically reduce our cost structure," explained Jon L. Gorney, senior vice president of information services and operations at NCC.

After installation in the first of NCC's four regional check proofing centers in January, the SIIPS system will automatically scan and read checks and other documents, using specialized high-speed document feeders and character-amount recognition technologies from NCR. The imaging software and associated applications run on NCR's System 3000 family of Unix computers.

Impressive feature

According to Gorney, the scalability of the NCR architecture was the product's most significant element, promising the ability to "size the system based on the volume and type of work we get." This feature also means NCC can start small and not "bet the bank" in a large capital investment that does not pan out.

From a technology standpoint, Gorney said, NCR's character recognition subsystem was key. "Without this, we would not be able to justify [the investment]," said Gorney, who hopes to cut his labor costs in half once the system goes into production.

"Check image capture [in banking] is by no means pervasive," said Ned Miltko, senior vice president at Littlewood, Shain & Co. in Exton, Pa.

Unisys' InfoImage Image Item Processing System was announced in late 1989 and began being deployed at a handful of customer locations late last year. IBM's offering, which comes as an enhancement to its existing Item processing system for banks, was made generally available this month.

Nevertheless, Miltko said, announcements by NCR and others of microcomputer-based solutions have put pressure on Unisys and IBM to offer competitive products. Indeed, about 1½ months ago Unisys released an image statement solution for small institutions that uses a PC server.

An IBM banking customer who recently installed IBM's image statements product and is installing IBM's back-office image processing system agreed the NCR architecture had potential for the long term.

"But bottom line, we think we will save more money immediately with IBM because they've gone through the learning curve," said the user, who asked not to be identified. Two years from now, he added, NCR may have an "industrial-strength product" suitable for large institutions.

The user also predicted that in five to 10 years, all vendors will move to distributed bank imaging systems. Such distributed systems will permit the scanning of checks and other documents at the branch offices where they are received. This arrangement is not feasible today, he said, because high-bandwidth networks that carry the image traffic are prohibitively expensive.

NCR and NCC, which announced plans for the SIIPS deployment early last month, made a point of describing it as a test, noting that it would be part of the "NCR Image Technology Validation Program."



POD squad

The following three U.S. banks currently use image proof-of-deposit (POD) in full production. All are Unisys Corp. sites:

- Comerica Bank in Detroit.
- Huntington National Bank in Columbus, Ohio.
- Signet Bank in Richmond, Va.

E-mail

NCR Corp. has released StarPro Enterprise Messaging, an enterprisewide electronic-mail messaging system.

The Unix-based system supports the X.400 international standard for messaging systems and X.500 for integrated directory services.

StarPro is available in a set of three products: MessageCentral400, the central component, provides the messaging backbone, an Internet gateway (RFC822) and mail boxes; Open Systems Interconnect (OSI)/Transmission Control Protocol (TCP) Connect provides the ability for MessageCentral400 and other OSI applications to exchange messages over a TCP/IP network; and OpenConnect400, which provides the gateway to LAN e-mail packages such as Microsoft Corp.'s Mail, CC:Mail and MHS-based systems.

Prices start $895.

➤*NCR*
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-2078

Modems

OmniTel, Inc. has announced the Business Card 2496C and the Business Card 2496C+ fax modems.

The2496C and the 2496C+ resemble a credit card in size and shape, and they fit into any PC with a Personal Computer Memory Card International Association Type II slot. Users can send and receive faxes at 9.6K bit/sec. The modems are compatible with the CCITT V.22 bis standard.

The 2496C for MS-DOS costs $349, and it costs $375 for Microsoft Corp.'s Windows. The 2496C+ costs $399 for DOS and $425 for Windows.

➤*OmniTel*
47281 Bayside Pkwy.
Fremont, Calif. 94538
(510) 490-2202

Unix

Pacific Software Group has introduced Version 1.0 of TaskMaster for Unix.

TaskMaster is a visual file manager and personal productivity tool. It has a point-and-shoot interface for controlling system functions and utilities and managing files. Users can build menus and run applications, create backups, find and browse files and directories and control print jobs. The ability to read and send mail and delete and undelete files is also provided.

Personal and group reminders can be scheduled that notify users even when they are not in TaskMaster, the company said.

A 10-user license costs $295. An unlimited user license costs $595.

➤*Pacific Software Group*
4703 Filly Lane
Riverside, Calif. 92509
(909) 681-2623

Demax Software has announced SecureMax 3.0 for the Unix environment.

SecureMax 3.0 is a distributed application that supports centralized security administration of an enterprisewide Unix security environment.

This release has a new console designed for Hewlett-Packard Co.'s HP/UX operating system, which offers users enhanced flexibility in executing security policies across the network.

Prices for Unix clients range from $6,000 to $20,000, while agent prices range from $125 to $1,500.

➤*Demax Software*
Suite 500
999 Baker Way
San Mateo, Calif. 94404
(415) 341-9017

Workstations

RDI Computer Corp. has announced the BriteLite LX portable workstation.

Based on Sun Microsystems Computer Corp.'s 50-MHz SPARCengine LX, the BriteLite LX offers an improved memory architecture that enables it to be configured with 16M to 96M bytes of memory, the company reported. BriteLite LX also has a high-capacity hard drive that possesses 450M bytes of internal disk storage. It has a Colorplus Active Matrix LCD display with a palette of 256,000 colors.

The BriteLite LX costs $15,995.

➤*RDI Computer*
6696 Mesa Ridge Road
Building A
San Diego, Calif. 92121
(619) 558-6985

XEROX

To add value to their database, they need to add color to their data.



This major insurance company needed to ensure its position in an increasingly competitive marketplace. That meant making customer service a priority. And that's a priority Chuck Schweitzer and a team from Xerox could help them achieve—with the Xerox 4850 HighLight Color Laser Printer.

As the first production-class duplex laser printer to offer highlight color, the 4850 lets them create documents that communicate more effectively. For instance, they can highlight variable data in Provider Directories so customers can find information they need quickly and easily.

It's a service their customers especially appreciate. And the company appreciates how the 4850 is the most cost-effective way to add color to variable data without incurring the prohibitive costs of offset printing. Not to mention the savings they enjoy by eliminating preprinted stock, reducing warehousing costs, and improving turnaround time.

If putting together results like this would stand out in your business, call 1-800-TEAM-XRX, ext. 609B.

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X helps Byer keep pace

By Joanie M. Wexler
SAN FRANCISCO

Clothing maker Byer California is leveraging the graphics-oriented X Window System as its desktop of choice. Its main goal: to keep pace with a whirlwind garment industry that is continually slashing manufacturing turnaround times and producing burgeoning numbers of garments.

The stepped-up nature of Byer's business, which includes a 500% increase over the past five years in the number of garment styles and items made, means the company can no longer create a physical clothing sample for each of the company's eight U.S. show floors where buyers from retail stores select merchandise, explained Michael Higgins, technical support manager at Byer.

So, Byer is using X, a bit-mapped graphics-oriented protocol, to electronically send sharp-quality photographs of a garment "within hours or a day so we can sell directly from the picture," Higgins said. The images travel over a BT North America frame-relay wide-area network.

Byer, a mass producer of moderately priced, American-made clothing, is deploying X terminals from market leader Network Computing Devices, Inc. in Mountain View, Calif., at a pace of about 20 desktops per quarter for the foreseeable future, Higgins said.

To aid in-house operations, Higgins has set up a configuration that merges information from SQL databases with pictures of garments on users' X terminal screens. Oracle Corp. databases on Sequent Computer Systems, Inc. minicomputers house information on garment inventory, colors, fabric types, model numbers and other information. This data pops up on the X screen alongside a scanned-in picture of the item that can include handwritten comments (see diagram).

A 30G-byte magnetic optical jukebox stores all the pictures and communicates to the X terminal through a Network File System (NFS) server and database server, which are both Sequent hosts running Unix System V.4. The NFS protocol makes the jukebox appear as a local file system on the database host.

Software called SView from Northern Development Group coordinates which image will be displayed and on which terminal.

The scheme allows salespeople and others "to readily identify a garment," Higgins explained. "Numbers [from a database] don't mean that much."

For example, garment makers view pictures to see if they have included enough buttons, zippers and bows on the item. Merchandising staff take a look when dealing with buyers so they can "talk intelligently about a bigger product set."

In addition, the shipping department can call up the picture and check it against a picking ticket to ensure the correct item is being shipped.

Next up for X deployment at Byer is the accounting department, where accountants will scan in all the backup for invoices and other documents. The use of X will allow workers "to see handwritten notes on a document, such as 'we didn't agree to pay air freight,'" Higgins explained.

Byer, *page 72*

ON SITE

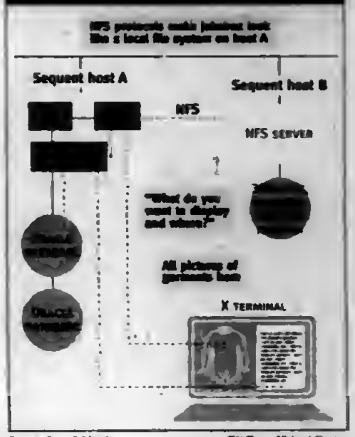
Byer California
San Francisco

Business challenge: To keep pace with quicker turnaround times for larger volumes of garment types and maintain service.

Technology: X terminals, Sequent clusters.

Results: Instead of creating samples for eight U.S. show floors, Byer can sell garments using electronically distributed photos.

Worth a thousand words to Byer



Source: Byer California
CW Chart: Michael Siggins

Tektronix updates display

X terminal interoperability, speed boosted

By Lynda Radosevich
WILSONVILLE, ORE.

■ Tektronix, Inc. last week introduced X Window System terminal hardware and software said to boost interoperability and performance and add support for PEX (Phigs Extension to X) three-dimensional graphics technology.

The company's Version 6.0 software lets system administrators integrate the diskless graphical terminals into Sun Microsystems, Inc., Digital Equipment Corp. and IBM host environments and other platforms. It includes a Sun Optimization Kit aimed at Sun's workstation customers. A separate DEC optimization kit is available as well, according to the company.

X terminal hardware now includes flash memory that lets users store fonts and connectors for ThinNet, ThickNet and twisted-pair Ethernet. List prices for Tektronix's TekXpress line start at $995 for monochrome and $1,995 for color.

Although he has not tried the new Tektronix terminals, Stephen Byers, a senior computer-integrated manufacturing engineer at Cummins Engine Co. in Columbus, Ind., said the Sun Optimization Kit should improve system administration by letting him boot up new terminals more easily.

X terminals are typically used for scientific and engineering applications but are moving into commercial applications such as document imaging in financial services, according to Dataquest, Inc. analyst Jack Roberts.

Benefits cited

Users benefit from the ability to simultaneously run sessions from different hosts in windows. System administrators benefit from central administration and less expense than comparable workstations or PCs.

While providing the graphical capabilities of workstations or high-end PCs, "X terminals don't become obsolete as fast as workstations or PCs because so much functionality is in the software," Roberts said.

Other X terminal vendors include Network Computing Devices, Inc., Hewlett-Packard Co., DEC, IBM, Visual Technologies, Inc., NCR Corp., Human Design Systems, Inc. and Wyse Technology, Inc.

For Cummins, X technology is the answer to the challenges of internetworking with various hosts. The 73-year-old company, which manufactures diesel engines for trucks, plans to replace "thousands" of PCs, Apple Computer, Inc. Macintosh computers, VT terminals and 3270 terminals with diskless X terminals during the next 10 years.

The diskless X terminals allow users to display applications running on the firm's IBM mainframes and Unix-based workstations and other networked host devices.

As part of the transition, the company last January installed 150 X terminals from Tektronix and 50 Unix-based DECstation 5000 workstations on an Ethernet network in a new manufacturing plant in Walesboro, Ind. The X terminals connect users to the workstations, giving them access to graphical office and plant floor applications without supplying expensive workstations to each desktop.

Looking for interoperability

End to standards battle sought

By Elisabeth Horwitt
SILVER SPRING, MD

Standards-conscious user and vendor groups are starting to take a hard look at a white paper put out by The Gosip Institute that is intended as a basis for discussion about how to bring Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect (OSI) into an integrated, interoperable networking standard.

"We tried to describe the most likely path for the two sides to come together," said Dick desJardins, director of the independent institute and principal author of the paper. He added that he wrote the paper "as a polemic for moderates" on both sides of the standards issue to come together "as one community."

Such a rapprochement will come none too soon, given that the TCP/IP-OSI schism is making it increasingly difficult for users in the same industry, company or community to share information and computer resources.

The problem is particularly acute on Internet, the national science, research and government network, because the government mandates migration to OSI, while military and private-sector users are determined to continue using TCP/IP, said Jerry Johnson, a standards analyst for the state of Texas.

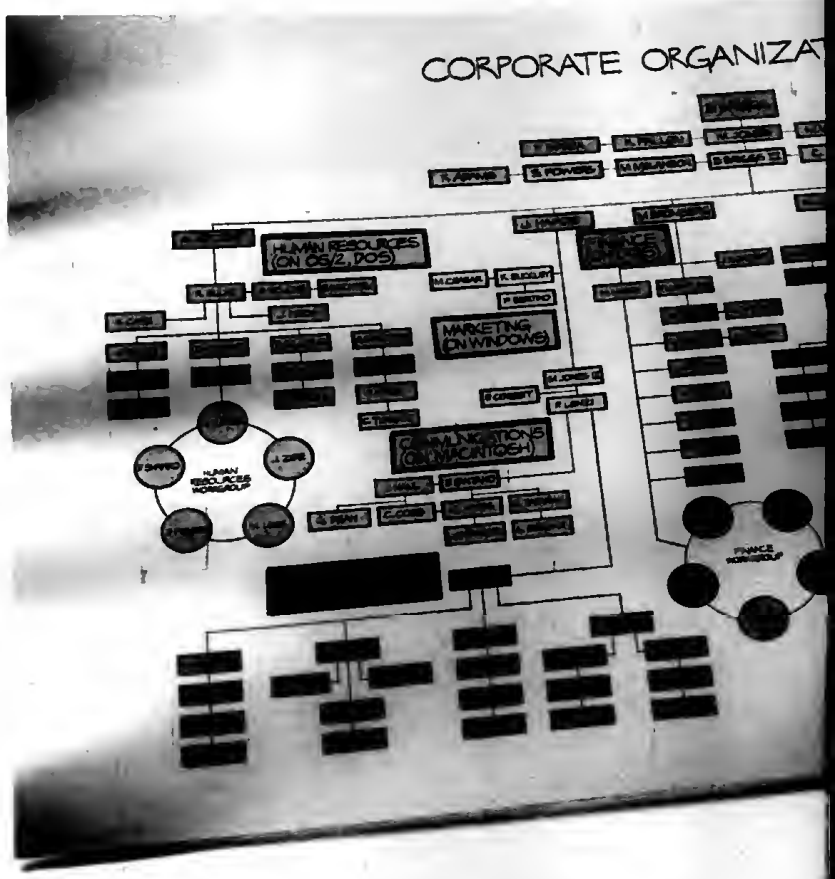
The paper was released by the institute this summer and is

Standards, *page 72*

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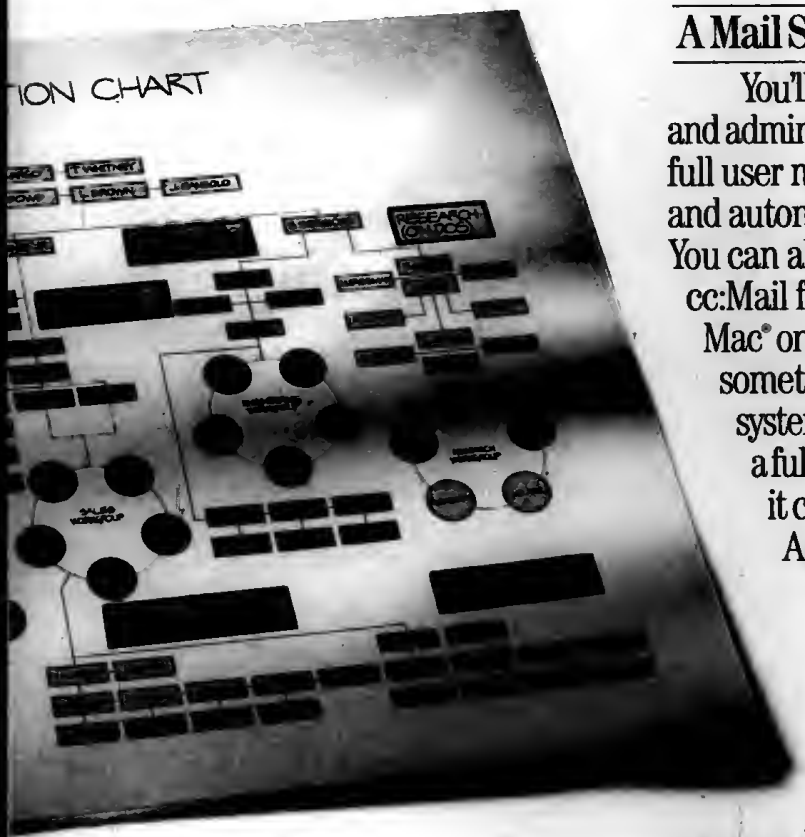


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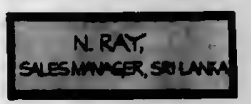


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In Brief

GIS being built

The University of Michigan's Center for Information Technology (CITI) and the Open Software Foundation (OSF) have agreed that CITI will develop an application that demonstrates the capabilities of the OSF's Distributed Computing Environment. The geographic information system application will be based on the university's Geographic Name Service, a database available over Internet that contains facts about geographic areas in the U.S. The new application will include a Motif-based client that will access a variety of databases and provide world map information.

NetWare tool ships

Novell, Inc. is shipping Version 3.0 of NetWare 3270 LAN Workstation for DOS, its IBM 3270 emulation package for DOS workstations. The package, which works with Novell's NetWare for Systems Application Architecture software, is said to provide encryption of DOS-to-host connections and dynamic reconnection to a backup host or server if the primary connection is lost. It is priced at $1,495.

Frame-relay priorities

StrataCom and Cisco Systems, Inc. have announced an enhancement that is said to enable users to assign priorities to different types of frame-relay traffic: for example, give IBM Systems Network Architecture traffic a higher priority than local-area network protocols such as Novell's IPX. The feature is scheduled for availability early in 1993 for Cisco routers and StrataCom IPX switches.

Retix picked

Societe Internationale de Telecommunications Aeronautiques (SITA), the international network service provider for the airline and travel industry, has selected Retix to provide a full suite of Open Systems Interconnect products for SITA's global messaging network, Retix said.

X helps Byer

CONTINUED FROM PAGE 69

Without X in this scenario, "you can't link the Oracle database with the picture," he said. A customer's history and scanned documents appear simultaneously when queried.

X terminals are the premier desktop at Byer, largely because Higgins has "successfully kept PCs out of the company. We ship garments —, not maintain DOS versions and get into operating system wars."

However, a few Apple Computer, Inc. Macintoshes at Byer can participate in the X network via the MacX protocol included in the Macintosh's System 7.0. The Macintoshes are osed mainly for spreadsheets and word processing.

Higgins has resisted local-area network operating systems as well. "We can do with Unix anything we could do with a [network operating system]," he said. "And as soon as you deploy a [network operating system], you've restricted your platform choice." For example, he said, if Novell, Inc. NetWare nsers want to run a product that is not a NetWare Loadable Module, "it's a bummer."

Higgins said he will not deploy a network operating system "until they drag me from here kicking and screaming" because he does not consider them "open."



Software AG ups protocols

By Gary H. Anthes
RESTON, VA

Software AG nf North America, Inc. has announced support for additional communications protocols for its Entire Net-Work software for connecting heterogeneous compating environments.

Entire Net-Work is a "middleware" product that provides transparent communication between otherwise incompatible environments such as LU6.2 linked with Transmission Control Protocol/Internet Protocol (TCP/IP).

New protocols supported include TCP/IP for Unix, VMS and mainframes and support for Novell, Inc. SPX, NetBIOS and Systems Network Architecture (SNA) LU6.2 on OS/2. By the end of the year, Software AG said, the produet will also support SNA LU6.2 for Unix, TCP/IP and Novell SPX for Windows, TCP/IP and DECNet for OS/2 and SNA LU6.2 and Wang network for Wang VS.

Entire Net-Work is a transport layer that supports multiple protocols and platforms with a common application programming interface (API). In distributed applications, it transparently intercepts API calls, translates them into the required format and then returns data back to the application regardless of where the program logic and the database are in the network.

Entire Net-Work is priced from $450 to $59,900 per node, with discounts and site licensing available.

End to standards battle sought

CONTINUED FROM PAGE 69

now making the rounds of standards bodies such as the Corporatioo fnr Open Systems International and the Open Systems Environment Workshop sponsored by the National Institute of Standards and Technology.

Interest is high among the broad range of users in industries such as power and utility, mannfacturing and aerospace, as well as government sectors, which have officially adopted OSI as their future standard but are still using TCP/IP extensively on their networks.

> Interest is high among a broad range of users in the utility manufacturing and aerospace industries

"Tve been telling state agencies for several months that neither TCP/IP nor OSI is the ideal solution," Johnson said. "Each has its own warts; TCP/IP needs some fixes in [functional] areas; OSI needs to be delivered faster and cheaper."

"I think the Gosip Institute effort is very useful because it puts on the table a concrete proposal that would converge the two worlds in several respects," said Augie Nevolo, chief telecommunications engineer at Pacific Gas & Electric Co. and chairman of the User Alliance for Open Systems.

The paper's centerpiece is the "Internet 2000 Framework," which describes how "anything over anything" interoperability could he achieved for multiprotocol oetworks. The architecture describes a series of commoo "interface definitioos" that would optimally allow users to mix and match application services, network services and transport protocols.

For example, an applicatioo would be able to send a file via the FTP or FTAM file-transfer service, running over the TCP or TP4 transport protocol and the IPor CLNP network service.

Share and share alike

One of the paper's key recommendations is for standards bodies such as the Internet Engineering Task Force (IETF) and the Industry/Government Open Systems Specification (IGOSS) group to share the best features of each standard wherever feasible.

For example, the institute urged that the IETF adopt OSI's Connectionless Network Protocol as a means of remedying some serious limitations in TCP/IP's routing and addressing protocols. IETF has been debating this question for some months oow.

The institute further recommeoded that OSI standards bodies adopt the IETF's more efficient methods nf identifying, designing and finalizing new protocols — a suggestion that generated great user enthusiasm.

"In the ISO world, everything is done by consensus over a long period of time, while the IETF and Internet community work from a principle of developing code and proposals, putting them on Internet, getting participation from a variety of folks and quickly moving forward," Nevolo said.

The paper has gone through two iterations so far, desJardins said. A third version, due this month, will "have a lot more comments behind it," garnered from "a moch larger group" of vendors and users that have read it in the past couple of months, he added.

"We've got good comments nn how the communities can come together," desJardins said. In particular, the upcoming release will focus on the Internet community's current activities to formulate the next generation of TCP/IP, he added.



Vendors tuned in

The Gosip Institute's strategy is similar to the Network Blueprint that IBM has proposed for multivendor networking. In addition, Digital Equipment Corp. is pretty much in tune with the Gosip Institute's framework, having already introduced interoperability and integration of TCP/IP and OSI in its DECnet Phase V release, according to DEC. DEC also supports the Institute's goal of merging the two standards.

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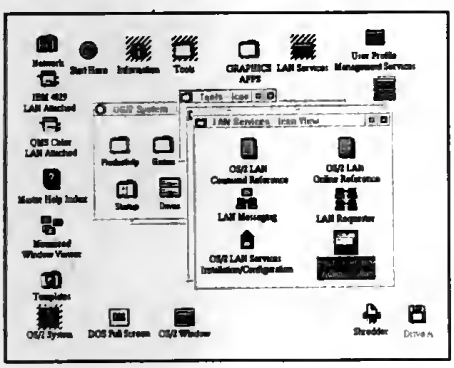
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Outsourcing cutover to Sabre system nears for Alaska Airlines

By Mark Halper
SEATTLE

They say changing outsourcers is hard to do, but the information systems folks at Alaska Airlines are confident their forthcoming switch will go smoothly, provided they have enough sharp pencils on April 17.

That is the day Alaska Air plans to eat over its computerized reservation system (CRS) from Electronic Data Systems Corp.'s Shares system — formerly Continental Airline's System One — to AMR Information Services, Inc.'s (AMRIS) Sabre system.



And although the airline expects to have completed a massive software conversino of more than 100 of its own programs by that eventful day, it most wait until the last secood to start reloading its constantly changing eustomer data from EDS' system to AMRIS'.

The "flash cut" data transfer, as Alaska Air calls it, will take from two to eight hours, during which time oeither system will be in operation, said Ed White, Alaska Air's assistant vice president of customer service.

So, fnr those trying few hnurs — which Alaska Air is scheduling for the lobster shift in the Pacific time zone, when its customer requests are lightest — the airline will rely on a rather archaic technology. "We'll be taking requests on paper," White said.

Alaska Air has not yet determined how it will shuttle data from an EDS data center in Charlotte, N.C., to an AMRIS center in Tulsa, Okla.

"Whether we do it electronically or physically is still up in the air," White noted.

An electronic transmission would accomplish the job faster than would flying tapes from one eity to the other. But, White observed, "because of the size of our records, it may not be prudent to do it electronically." The airline keeps more than ooe million records, he explained.

And, he added, the more rudimentary approach of flying tapes served Alaska Air well once before, after the company acquired Horizoo Airlines and had to transfer data from Horizon's system to Alaska Air's.

Heavy load

The eatover day will perhaps be the most ceremonious for the airline, hut like a crew preparing for a rocket launch, it has much work to dn before lift-off.

Both Alaska Air and AMRIS, for instance, will

Alaska Air, *page 80*

It's all in the name

Fedex, others count on name software

By Gary H. Anthes

When it absolutely, positively has to get there overnight — but it doesn't — Federal Express Corp. faces a daunting systems challenge: how to search through 56 billion bytes of informatioo to find the airbill for John Smith at XYZ Corp. while Smith waits on the telephone.



Federal Express adds 2 million airbills to its files every working day. The generation nf the indexes for those airbills and their sabsequent nse to retrieve information from the gargantuan database is made possible by software from Search Software America, Inc. (SSA) in Old Greenwich, Conn.

SSA's clieots — which include AT&T, Visa International, Inc., Government Employees Insurance Co., Kemper Financial Services, Inc., Andersen Consulting and 100 others — are organizations whose operations depend on databases of names and addresses. For these firms, a slow or failed name match can mean a lost sale or an angry customer.

By generating maltiple keys for a name, SSA's software can find Robert Jones if you enter Bob Jones, John Smith if yoo enter Smith John and XYZ Corp. if you enter XYZ, Inc. Furthermore, it adapts and optimizes its algorithms to the aser's uniqne data.

Fedex runs its airbill data through SSA-Name3 to generate multiple 5-byte search keys for each airbill — for sender's name, sender's company, recipient's name and recipient's company. Those nombers become indexes in IBM IMS FastPath files. When doing a query, SSA-Name3 returns to the application keys or ranges nf keys representing "search strategies" that tell the application where to look in the database.

If the first attempt does not retrieve the correct entry, the aser can successively widen the search window, getting additional lists of possible matches until the desired record is found.

"We had a homegrown program, hut we wanted a more robust

Fedex, *page 80*

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Writers in the press and financial analysts on Wall Street are even compiling lists as to which are about to go under. While all of these involve an amount of speculation on the part of their authors, you may be surprised to learn that many of the larger clone companies appear on the majority of them.

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Mainframe transition

Unix text editor eases move

By Johanna Ambrosio

Some mainframe shops have discovered a kinder, gentler way to migrate to Unix: give end users a Unix version of their existing mainframe text editor.

The Workstation Group, a vendor in Rosemont, Ill., sells a Unix version of IBM's Interactive System Productivity Facility (ISPF) called uni-SPF. Some 75 customers are using the package, according to Susan Young, vice president of marketing.

The ISPF editor runs on IBM mainframes under the VM and MVS operating systems.

Everybody knows it

L. L. Bean, Inc. in Freeport, Maine, has uni-SPF on a Sun Microsystems, Inc. Model 490, said Jeffrey Newman, an operations support specialist.

"We use it to hide the Unix edit facility for the mainframe programmers," he said. The text editor that comes standard with most Unix systems, vi, "is not user-friendly. Everybody already knows ISPF," Newman added.

Introduced in January 1992, uni-SPF includes full-screen editing, cut-and-paste commands, a split-screen ability, a file browse feature and other utilities. It runs on Sun Microsystems, Inc. Sun 3, Sun 4 and Sun SPARCstations, Domain Series 3000 and 4000 machines and other computers from Hewlett-Packard Co. It also runs under IBM's AIX and Amdahl Corp.'s UTS as well as on other platforms. Prices start at $399.



Some 35% of all IBM or plug-compatible mainframe shops have ISPF, a mainframe text editor that runs under VM or MVS, according to Computer Intelligence in La Jolla, Calif.

Warm and fuzzy

Spencer Lauer, senior engineer at Sikorsky Aircraft in Stratford, Conn., said, "ISPF is the editor a lot of our engineers are used to. It's a simple matter of economics to move people off the mainframe and onto Unix workstations, but the standard Unix editors are very confusing to people."

Approximately 20 Sikorsky aircraft design engineers are now using uni-SPF.

Ray Evans, lead programmer/analyst at Union Oil of California (Unocal) in Brea, Calif., said uni-SPF includes "most of the features" found in ISPF but that some special features, such as text flow, are not yet part of the product.

"There are some differences," Evans said, "but the way it looks and feels works pretty much like the mainframe version. It's a real time-saver in getting people up and running on Unix."

Some 20 Unocal engineers are using uni-SPF on an IBM RISC System/6000.

Unisys extends its 2200 mainframe series

By Thomas Hoffman

BLUE BELL, PA

Unisys Corp. recently extended the high end of its 2200/900 series mainframe computers by adding six- and eight-processor models.

Introduced in September 1991, the original high-end 2200/900 machine was a four-processor model.

The new eight-processor model expands the Unisys Extended Transaction Capacity system to 32 processors. Extended Transaction Capacity permits the coupling of up to four multiprocessor hosts.

No changes were made to the OS/1100 operating system software.

The six-processor model is priced starting at $19 million. The eight-processor machine is listed starting at $25 million. Both systems will be available in the second quarter of 1993.

At Fedex, it's all in the name

CONTINUED FROM PAGE 77

searching mechanism," said Dave Lorrig, database adviser at Fedex.

He said Fedex has used the self-optimizing algorithms in SSA-Name3 to fine-tune searches for international addresses. Fedex has also instructed the software to ignore common but useless words such as "mailroom" in addresses and to weigh the left-hand portion of company names most heavily but give the greatest weight to the right-hand portion when a person's name is being sought.

According to Geoffrey Holloway, SSA president, commonly used name-search algorithms — many based on principles laid out in 1916 — are flawed. "An exact match is what everyone thinks they want, but if you have two records on file and one is an exact match and one is very similar, which one do you want?" A single keying error may leave the correct entry unfound, he said.

"If you're in a business where not matching the record doesn't matter too much, OK. But if you are about to release a prisoner, it's not too good if you don't find the outstanding warrant," Holloway added.

The National Insurance Crime Bureau in Palos Hills, Ill., used to go at its database with a self-developed algorithm but now accesses the 22-million-record DB2 database with SSA-Name3. "Now, not only are we getting more exact matches, we are getting variations that are similar," said Al Krasich, a senior programmer.

Richard Hon, director of data processing at the Georgia Department of Revenue, said the state tax agency once relied on homegrown search algorithms. "They were not very good, and we were constantly struggling with all the exceptions," he said.

SSA-Name3, installed two years ago, has improved performance and search quality by "orders of magnitude."

In addition to helping process, for example, a check with an address but no taxpayer identification number and no legible name, the software has enabled the state to do things that were simply not possible before. For example, it can link the records for a person's business income tax, the sales tax from his business and the withholding tax for his employees, all of which are kept in separate systems that were difficult to cross-reference because of name and address variations.

"Now we can say, 'You are one and the same, and we are not going to give you an individual income tax refund because you still owe sales tax,'" Hon said. "In the old system, we'd have been sending out a refund check at the same time an agent was out there padlocking his business."

SSA-Name3 for a midsize IBM mainframe sells for $48,000. SSA-Extensions, a set of tools that, among other things, "scores" records to make humanlike judgments about the probabilities of correct matches, sells for $18,000.

In Brief

HP ups staff

Hewlett-Packard Co. continues to beef up its support and service operations. The firm last week disclosed that it has added about 150 staffers to its professional services group since August and that it plans to add another 150. The company has also begun offering its salesmen commissions and quotas on service sales. All this follows a reorganization last August in which the firm elevated the Worldwide Customer Support group to directly report to the chief executive office.

Net connections

Network Systems Corp. and Storage Technology Corp. said last week they had agreed to jointly develop connections between distributed networks and mainframe storage systems, such as Storage Tek's tape libraries. The products, to be jointly marketed, will allow different computers to share data. The firms said the alliance would generate $50 million in revenue in the next three years.

Alaska Air outsourcing cutover nears

CONTINUED FROM PAGE 77

be busy converting and modifying their own software so that their programs can talk together.

Furthermore, the company is refitting its reservations and cargos with 1,800 new terminals designed for Sabre. The terminals will replace the asynchronous terminals in place for the EDS system. The company will also have to send some 3,000 users for at least a week of training on the new system.

In case all is not ready by April 17, EDS has agreed to stay on for an extra couple of weeks, until April 30.

"It's a little fudge factor, in case we need the cushion," White explained.



Alaska Air's Ed White *has been reviewing CRSs for nine years*

Watching options

The decision to change reservation systems comes after years of constant review of performance and functionality.

Alaska has been using Shares and its predecessor systems — System One and Mutual Computing Services — since 1973, through a series of long-term and short-term contracts, White said. EDS recently took over System One from Continental.

As a matter of sound business practice, Alaska Air has habitually evaluated other CRSs for comparative functionality and cost-effectiveness.

"We've been in the process of reviewing alternatives for the last nine years," White said. "It's been a lifetime project for me. It's not an easy subject to get familiar with. It's not quite as simple as comparing a 1-2-3 spreadsheet with an Excel spreadsheet."

White said the company has been satisfied with the EDS relationship but that three features AMRIS recently added to Sabre convinced Alaska Air it was time to part ways with the system the airline had been using in one form or another for almost two decades:

- Sabre can now automatically handle double posting of flights, a technique common at Alaska Air in which the airline uses two flight numbers for the same flight.
- Sabre requires fewer keystrokes than Shares, cutting down on time and thereby saving money.
- Sabre includes more on-line documentation than Shares.

Alaska Air made its decision to jump to AMRIS in October [CW, Oct. 26].

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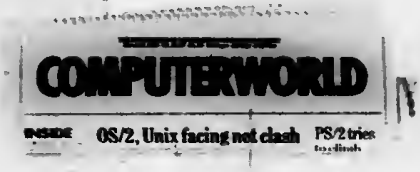
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The Newspaper of IS

Mainframe storage devices

Buyers' Scorecard: HDS and EMC head mainframe storage list

By Derek Slater

The conventional and the unconventional finished in a dead heat in the Buyers' Scorecard on mainframe storage devices.

Hitachi Data Systems Corp.'s standard 7390 direct-access storage device (DASD) and EMC Corp.'s Symmetrix disk array technology ran neck and neck, finishing in a tie for first place in overall user satisfaction, with 91 points apiece. Amdahl Corp.'s 6390 and IBM's 3390 followed, with 83 points each.

The HDS, Amdahl and IBM products offer roughly comparable characteristics, at least on paper, according to analysts.

"They tend to be similar; otherwise they wouldn't be competitive," said Robert Katzive, an analyst at Disk/Trend, Inc.

However, HDS users gave their product distinguished ratings in a number of areas, including reliability and cost of acquisition and maintenance. In verbatim responses, users lauded HDS equipment for its IBM compatibility, but they also said HDS sometimes lags behind its DASD competitors in offering advanced features.

EMC's Symmetrix products are based on small form-factor disk drives integrated with a large memory cache. Most of the EMC respondents reported using models in the Symmetrix 4800 line, which was introduced in January 1992. Symmetrix scored well in reliability and compatibility. It also earned the highest marks in floor space requirements and ease of expansion.

EMC recently announced a new Symmetrix product, the 5500, which offers greater capacity of up to 240 gigabytes. The 5500 also emulates IBM's 3390 and provides native support for IBM's Escon channels, which was mentioned on the wish lists of Symmetrix 4800 users.

Amdahl's users pointed to their product's reliability and price as key selling points. The 6390 also offers more configuration options than its competitors. But it received low marks in several areas, including efficiency of environmental controls and ease of operation.

Pricing issues were the Achilles' heel of IBM's 3390. Users rated it well below its competitors in both cost per megabyte of storage and cost of acquisition and maintenance.

However, with the exception of a few problems with 3390 Model 2 units, users said the 3390 is a reliable system.

Users indicated that higher capacity is the most desired improvement for current DASD systems. Improved caching was also frequently cited: 86% of the respondents said they rely on caching features to maximize system performance. Better manageability, flexibility and performance were other features DASD users said they would like to see.

Some DASD users noted they are keeping a watchful eye on forthcoming redundant arrays of inexpensive disks (RAID) technology.

Of the IBM, HDS and Amdahl respondents, 42% said they plan to consider replacing DASD systems with RAID products such as Storage Technology Corp.'s long-awaited Iceberg. Storage Tek's product is expected to offer a high level of redondancy, coupled with a low cost per megabyte of storage.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their mainframe DASD products in 13 categories.

Users also rated the importance of each category. All categories were factored into the final scores. (See the methodology on the following page for a complete description of the scoring process.) •

Big Blue lead

IBM holds a whopping 85% share of installed DASD systems, according to Computer Intelligence. HDS accounts for a 6% market share, followed by Amdahl with 4% and Storage Tek with 3%. The remaining 2% share is held by various other companies. Computer Intelligence estimated the total U.S. installed DASD capacity to be in excess of 1.2 petabytes, or 1.2 million gigabytes.

Amdahl's 6390

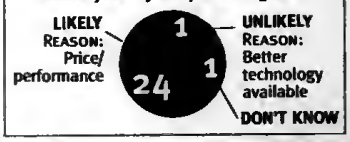
RESPONSE BASE: 26 USERS

9.0	Compatibility with installed hardware
8.8	Reliability
8.8	Responsiveness of vendor service
8.6	Ease of operation
8.5	Ease of expansion
8.5	Overall performance
8.4	Quality of technical support
8.2	Cost per megabyte of storage
8.1	Total capacity
8.1	Floor space requirements
8.1	Learning curve
7.7	Efficient environmental controls
7.6	Acquisition and maintenance costs

LIKES: "It's very reliable and cost-effective."

DISLIKES: "It lags behind others in technical features at the controller level."

Would you buy the product again?



EMC's Symmetrix

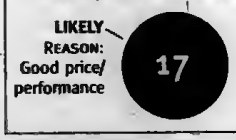
RESPONSE BASE: 17 USERS

9.6	[illegible]
9.5	[illegible]
9.4	Overall performance
9.3	Reliability
9.2	[illegible]
9.2	[illegible]
9.1	[illegible]
9.1	[illegible]
9.0	[illegible]
9.0	[illegible]
8.9	Learning curve
8.8	Cost per megabyte of storage
8.1	Acquisition and maintenance costs

LIKES: "We like its speed and minimal floor space requirements."

DISLIKES: "It doesn't work well with some software."

Would you buy the product again?



HDS' 7390

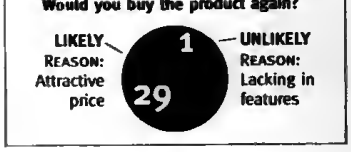
RESPONSE BASE: 30 USERS

9.7	Compatibility with installed hardware
9.6	Reliability
9.5	Overall performance
9.4	Ease of operation
9.1	Responsiveness of vendor service
9.1	Total capacity
9.0	Cost per megabyte of storage
9.0	Learning curve
8.9	Efficient environmental controls
8.9	Quality of technical support
8.9	Acquisition and maintenance costs
8.8	Ease of expansion
8.8	Floor space requirements

LIKES: "It's very reliable and has a good price/performance ratio."

DISLIKES: "They need to keep up with IBM's upgrades."

Would you buy the product again?



IBM's 3390

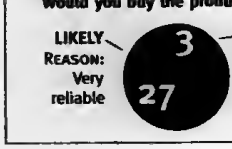
RESPONSE BASE: 30 USERS

9.6	[illegible]
8.9	[illegible]
8.8	[illegible]
8.7	[illegible]
8.7	Overall performance
8.5	Learning curve
8.5	Reliability
8.5	Ease of expansion
8.3	Total capacity
8.1	[illegible]
7.8	Floor space requirements
7.1	Acquisition and maintenance costs
6.5	Cost per megabyte of storage

LIKES: "The 3390 is reliable, and they've increased the speed."

DISLIKES: "They use more power in cooling down, and the cost is a little high."

Would you buy the product again?



Mainframe storage devices

Mainframe storage products

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 30 users each for IBM's 3390 and HDS* 7390; 26 users for Amdahl's 6390; and 17 users for EMC's Symmetrix.

MEAN SCORE 87 TOTAL POSSIBLE SCORE 100

Product	1991 score	1992 score
Hitachi Data Systems' 7390	86	91
EMC's Symmetrix	NR*	91
Amdahl's 6390	88*	83
IBM's 3390	80	83

* EMC's Symmetrix and Amdahl's 6390 were not rated in 1991. Amdahl's older 6380 product received a rating of 88 in last year's survey.

DASD advances continue

DASDs are nothing new, but DASD vendors are putting energy into staying on top of the market. Amdahl Corp., IBM and Hitachi Data Systems Corp. all announced new storage modules and products in 1992 to increase the flexibility and capacity of their DASD offerings.

Amdahl jumped out in front in January of last year with the release of new, higher-capacity drives for its 6390 systems. Users can fill each 6390 unit with up to 16 drives in either 1.9G- or newer 2.8G-byte capacities. IBM's Model 1, Model 2 and Model 3 3390s were released in 1992 as well through IBM's AdStar unit. The 3390 models use 5¼-in. drives.

In 1993, DASD products will face increasingly stiff competition from disk arrays. Redundant arrays of inexpensive disks (RAID) systems comprise a controller and several small form-factor disk drives; the controller distributes or "stripes" data across the drives. Since the system can write data to several drives concurrently, RAID can offer performance advantages over single-drive systems in some environments.

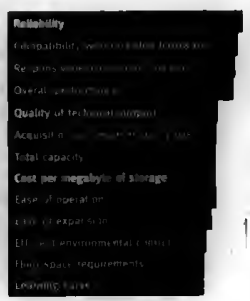
Several RAID levels also involve storing parity information that helps reconstruct missing data in the event of a crash. EMC's Symmetrix high-end 5500 announcement at the end of 1992 added new levels of redundancy and native Escon connectivity to the Symmetrix line. In 1993, the company plans to add Escon support for its older 4800 models and expand their capacity to 90G bytes.

Storage Technology Corp.'s Iceberg will offer enhanced RAID Level 5 capabilities, with data striping, parity and compression. Iceberg's 32 channels will enable it to handle storage duties for four host systems simultaneously. The final ship date for Iceberg remains uncertain. Analysts said they expect the system to enter field-testing sometime around April 1993.

Ratings in order of importance

Users said reliability is the key requirement for mainframe storage systems, followed in importance by compatibility and responsiveness of vendor service

IMPORTANCE RATING	
9.5	Reliability
9.3	
9.2	
9.1	
8.5	Quality of technical support
8.4	
8.4	Total capacity
8.4	Cost per megabyte of storage
8.4	
8.2	
8.0	
7.9	
7.9	



Selected specs

DASD products offer similar capacities, while pricing varies widely depending on configuration

Product	Capacity	Data transfer rate	Average seek time	Sample pricing
HDS 7390	90G bytes per string	4.2M bit/sec.	8.5-12.5 msec	$155,450 for 11.3G-byte 7390-3 A model
EMC Symmetrix 4800	60G bytes	4.5M bit/sec.	NA*	Starts at $310,000 for 10G-byte model
Amdahl 6390	90G bytes per string	4.5M bit/sec.	11.5 msec	$128,700 for a low-end 7.6G-byte unit
IBM 3390	90G bytes per string	4.2M bit/sec.	17-22 msec	Starts at $201,800 for 3390-3 A model

*NA: Not applicable. A single Symmetrix 4800 unit contains multiple drive types and up to 3G bytes of cache.

Vital statistics

Profile of users who rated these products
RESPONSE BASE: 103

What is your position?	
CIO/VP/IS director	19
IS manager	19
Operations manager	16
Systems analyst	10
Other	39

How long have you been using this product?	
More than two years	50
One to two years	30
Less than one year	23

What is your responsibility for mainframe storage devices? (multiple responses permitted)	
Evaluate or recommend vendors	80
Set standards for your organization	74
Determine need	59
Approve or authorize purchase	48

BUYERS' SCORECARD METHODOLOGY

User names were obtained from nonvendor sources. First Market Research Corp., an independent data collection company in Austin, Texas, conducted the survey and tabulated the results.

The response base was 30 users each for IBM's 3390 and Hitachi Data Systems Corp.'s HDS 7390, 27 users for Amdahl Corp.'s 6390 and 16 users for EMC Corp.'s Symmetrix.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Buyers' Scorecard.

To compute the overall score for each product, perform the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10.

Round off numbers where necessary.

Computerworld thanks the following for their assistance in preparing this Buyers' Scorecard: Robert Katzive, Disk/Trend, Inc.; CW Database Division; and Bob Abraham, Freeman Associates.


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Encompass keeps on globally trackin'

By Garry Ray

In 1989, AMR Corp. and CSX Corp., two powerhouses in the global transportation industry, teamed up with an ambitious goal. The companies, with combined revenue of more than $16 billion, decided to apply their formidable resources to the problem of global shipping logistics and planning.

AMR, the parent company of American Airlines, had already tackled such problems with its Sabre flight reservations system. Sabre has been so successful that its fiscal 1991 net profits exceeded $135 million, significantly more than the airline it supports. CSX, with 1991 revenue of $8 billion, is one of the world's largest land, ocean and rail shippers.

The partners launched their joint Global Logistics Venture secretly about three years ago. Known since its April unveiling as Encompass, the Cary, N.C.-based partnership has devised a client/server software system, also called Encompass, that has one overriding goal, according to Jim Schwab, director of product management.

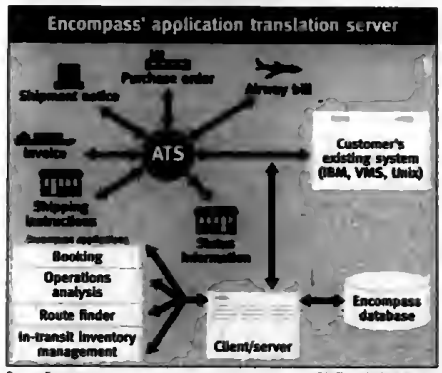
Calling the concept "in-transit inventory management," Schwab said Encompass will provide manufacturers with "the status of their inventory-in-motion from the time they put it on a purchase order until the time it arrives at its destination." Currently, "when goods leave the dock, they go into a transit black hole," he noted.

To solve that problem, Encompass faced the challenge of linking manufacturers, shippers and third parties such as freight forwarders in a global tracking system. That drove the move to a client/server architecture with the ability to rapidly port the applications and system software to a variety of platforms.

Even though all transportation parties need to communicate, "shippers wanted to control their own data on-site," said David Cunningham, vice president of sales and marketing. "We provide [application] software, which he can control. We also wanted to provide security and control of data."

To tackle the issue of applications portability, Encompass wrote its five major application modules using products from Uniface Corp. in Alameda, Calif., according to Rick Pott, senior vice president of development and operations.

The Encompass development effort, which began little more than a year ago, required about 70 staff programmers and another 20 based at various third-party software providers. Nearly one-quarter of the staff programmers were dedicated to applications programming using Uniface, with the remainder working on communications, database and systems software.

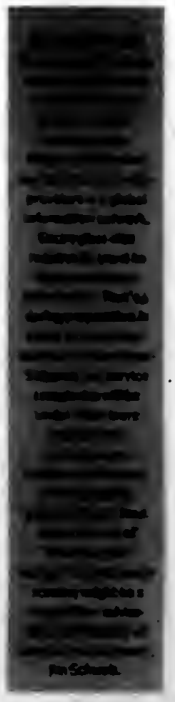


Source: Encompass — CW Chart: Michael Siggins

Programmer/analyst Rick Peller said the early selection of Uniface tools had reduced Encompass' overall development time by about one-third. "If we chose ANSI C and an interface [building] tool, it would have tripled the programming time," he said. "It was important to the company to get to market as soon as possible."

An early evaluation of Uniface included the Smalltalk language, but "we just needed something to compare Uniface with. That's what people knew about," Peller said.

Although development continues in the Cary, N.C., facility on a Digital Equipment Corp. VAX 6510 cluster, Encompass was designed to accommodate client and server platforms. The first server implementation, which Pott said is being tested by Procter & Gamble Co. and DEC, uses Sybase, Inc.'s Sybase running on DEC's VMS operating system.



Jim Schwab

Training biggest obstacle in client/server move, survey says

By Gary H. Anthes

■ Companies spend $1.7 million, on average, for their first high-end client/server application, according to a survey of Fortune 1,000 firms by Forrester Research, Inc., a market research firm in Cambridge, Mass.

Those companies find that mastering client/server technology is not as hard as the training issues, with three-quarters of information systems professionals in large companies lacking the basic skills needed to move to client/server. According to Forrester, the companies spent $800,000, on average, to retrain their people, with one-time out-of-pocket costs per person likely to run $12,000 to $15,000 and yearly education costs between $1,500 and $2,500 per head.

"The main obstacle isn't technology," an IS manager at a petroleum refining company said. "Training, personnel and politics are a far larger challenge. As a result, we spent $4 million on training."

Forrester defines a "high-end" client/server system as one that directly impacts the financial state of a company, has 100 or more users and spans multiple sites.

Forrester said that because client/server technology is immature, the cost of developing applications will remain high for some time. "Costs will begin to fall in 1994 as a lot of holes get filled in," said John C. McCarthy, director of computer strategy research at Forrester. "In the age of diminishing budgets, this will be a bitter pill to swallow."

Companies surveyed by Forrester seemed to agree. An official at a scientific equipment company said, "LAN bigots say that the client/server world is cheap. Wrong. The initial price tag is quite a shock, but spread across five years, it doesn't look so bad."

McCarthy warned that companies attempting to do everything they are doing today plus move to client/server can expect to see their IS expenditures swell from 2% or 3% of sales to as much as 5%.

The report said companies preparing for client/server must structure their IS staffs into three components:

- Line MIS — groups of business-savvy developers and support people deployed in each business unit.
- Central MIS — audits Line MIS to enforce corporate standards for quality, security and interoperability.
- Outsourcing providers — increasingly will get the legacy systems and non-mission-critical systems.

"Companies scrambling to find room in the budget for client/server are going to outsourcing just to free up resources," McCarthy said. "But they are also doing it to show their IS organizations they are serious about this new technology. They are saying, 'You better learn it or get out.'"

McCarthy added that users will bear a new responsibility for justifying their systems. "Because a lot of stuff is being moved out to the business departments, users will have to prove bottom-line benefit from client/server rather than just praying to the gods at the glass house."

And users had better be prepared for some service-quality sacrifices. "Mainframe uptime and reliability are definitely something you forego," said an official at an industrial equipment company. The official's IBM RISC System/6000 server "has been down twice a week vs. twice a year with the mainframe. Also, AIX has backup and security problems that IBM must make bulletproof."

People problems

Training and support dominate the list of problems cited by managers with client/server systems

Number of respondents
In large firms with major client/server projects (Base: 25; multiple responses allowed)

Retraining IS	20
Training end users	15
Supporting multiple vendors	14
Immature tools	12
Server crashes	5
Database connection failures	3

Source: Forrester Research, Inc.



Canadian Airlines International Found A Strong CASE For Managing Change.

In the rapidly changing world of the airline industry, Canadian Airlines International Ltd. understands that keeping seats filled and continually exceeding customer expectations largely depend on how well they manage change. So when they wanted to implement a state-of-the-art frequent flier program in record time, they turned to IEF™ CASE software from Texas Instruments. The Information Engineering Facility (IEF) offers a diverse portfolio of software, which lets you do everything from rebuild high-maintenance-cost legacy systems to develop new strategic systems. And do it more efficiently with higher quality.

Widely recognized as the leading tool for achieving integrated CASE solutions, the IEF helped Canadian Airlines International create their *Canadian Plus*® frequent flier system in less than half the time it would have normally taken to build it from scratch.

Today, Canadian Airlines International knows the IEF can help them adapt to change in other areas as well. They realize the IEF has many strengths other than just enabling reduced application development times.

Richard Nelson, Director of Operations, Canadian Technology Services, Canadian Airlines International Ltd., said, "It (the IEF) has brought the airline tremendous benefits in staff and operating cost efficiencies."



Richard Nelson
Director of Operations
Canadian Technology Services
Canadian Airlines International Ltd.

In the end, Canadian Airlines International, with the help of the IEF, produced an outstanding frequent flier program. Customers get better service and Canadian Airlines International has increased passenger count.

Canadian Airlines International is just one of many companies in a diverse range of industries that have also found a strong CASE for managing change. We'd like to share a few more CASE histories with you. Call us now for a copy of *The IEF at Work*. Government purchasers please reference GSA#GS00K92AGS5530.

1-800-336-5236.

TEXAS INSTRUMENTS

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Application development tools

Slate Corp. has started shipping Version 1.0 of PenApps Application Builder for Microsoft Corp.'s Windows for Pen Computing.

The product is a visual development tool that creates forms-based and data-intensive applications for pen-based computer platforms. A screen/forms designer, a built-in database and the Slate PenBasic programming language are included in the integrated package. According to the company, the product is the only visual development tool that lets users automatically build unique pen-centric features, such as ink as a data type, markup mode, deferred translation and sketch fields, into every application. PenApps is also available for Go Corp.'s PenPoint operating system.

PenApps costs $995.

➤*Slate*
15035 N. 73rd St.
Scottsdale, Ariz. 85260
(602) 443-7322

Eden Systems Corp. has released Version 2.3 of ES RE/Vision, a Cobol measurement and re-engineering tool.

Version 2.3 has been integrated with Cobol/II conversion capabilities and comprises the company's Q/Auditor and Q/Artisan tools. Q/Auditor has the ability to determine a variety of critical OS Cobol constructs that are not supported by Cobol/II, such as ON statements and Report Writer language items. Q/Artisan can automate much of the Cobol/II conversion. Replacing Examine statements with Inspect statements and removing invalid File-Control clauses such as File-Limit and Processing Mode are among the new rules designed to convert OS Cobol constructs not supported by Cobol/II.

Prices start at $9,995.

➤*Eden Systems*
Suite 201
14950 Greyhound Court
Carmel, Ind. 46032
(317) 848-9600

Languages

Manguistics, Inc. has announced Version 5.0 of APL Plus II, an APL system.

APL is a programming language that lets users process arrays of numeric or character data for scientific and business applications. Version 5.0 enables users to build applications in Microsoft Corp.'s Windows and DOS environments. Key features include an APL Graphical User Interface tool kit of object-oriented utilities, the APL Plus II Debugger, Windows interface enhancements with Dynamic Data Exchange and new primitive functions designed to increase compatibility between APL Plus II and IBM's APL2.

The product costs $1,700.

➤*Manguistics*
2115 E. Jefferson St.
Rockville, Md. 20852
(301) 984-5000

Compilers

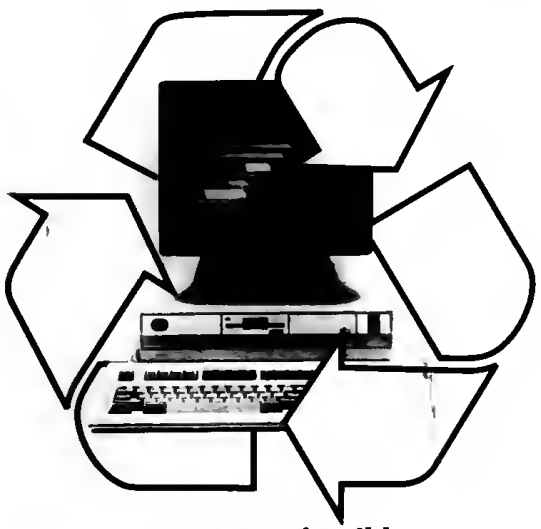
Microware Systems Corp. has introduced the Ultra C ANSI-compatible compiler.

According to the company, the product is the only C compiler from a real-time operating system vendor and the only compiler that addresses time-critical response in real-time applications. Algorithms can be optimized for real-time operations, and the product has the ability to transport C programs among existing and future Motorola, Inc. and Intel Corp. processors. Ultra C's compilation is divided into four major processes: a front-end language processor, a target processor back end, the assembly and linking function and the optimization and linking function.

The product costs $1,250.

➤*Microware Systems*
1900 N.W. 114th St.
Des Moines, Iowa 50325
(515) 224-1929

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FILES with faces



Appland Squad: *Team members Mitch Zoellner, director of implementation and support; Ianne McCrea, vice president of the strategic banking system; Kris Littell, senior product consultant; and Bob Barrett, president of Banc Once Ser vices Corp.*

A revolutionary new approach that personalizes customer records and products helps Banc One Corp. win *Computerworld*'s first annual "Excellence in Re-engineering" award.

By Mitch Betts

THERE'S A DIRTY LITTLE SECRET in the banking industry: Most banks have no way of knowing if a business tycooo such as Donald Trump is overextended on credit. That's because they lack the integrated informatioo systems that could draw a complete picture of the tycoon's multiple accounts.

In fact, consultants say most banks know little at all about their customers; records are scattered among the separate computer systems that bandle differeot kinds of banking transactioos, such as car loans and savings accounts.

Banc One Corp. — a Columhus, Ohio-based banking cooglomerate known for its hig appetite for acquisitions and technology — is changing all that. The natioo's 12th largest bank is replacing 17 fragmented systems with an integrated system that company officials say will give bankers a complete profile of their customers.

In business terms, that means more cross-selling, highly targeted marketing campaigns and tbe speedy rollout of new services tailored to individual customers.

It is a massive undertaking that exploits the power of distributed processing to revolutionize the way banking is done. This is why *Computerworld* has named Banc One winner of the first annual "Excellence in Re-Engineering" award. Our editors were impressed by several aspects of Banc One's business transformation:

•The Strategic Banking System, a huge software development project begun in 1986, handles transaction processing and acts as the central repository for all customer data. The mainframe-based system, with 10 million lines of code, reportedly cost more than $100 million. It has been installed ih 23 branches so far and will be deployed to hundreds more starting oext year.

•The Branch Automation System is an innovative, networked PC system used at the local level for customer service and as a front-end interface to the Strategic Banking System. So far, portions of the system have been implemented at 180 branches.

•The new systems are already showing benefits. The accuracy of basic customer data is up 25% to 50%, thanks to edit checks and the end of data redundancy, while the instances of cross-selling multiple financial products to a customer are up 15% to 20%.

•In a classic case of business process re-engineering, a subsidiary, Banc One Mortgage Corp. in Indianapolis, is moving from an assembly-line approach to a "work cell" approach to speed up mortgage processing (see story page 95). Banc One is coming off its most profitable year ever — net earnings were up 25% in 1991 — and analysts say the bank's technology strategy is an important part of that success. In the financial services industry, Banc One ranked No. 1 in a survey of its peers and consultants in the *Computerworld Premier 100* [CW, Sept. 14].

To appreciate Banc One's achievement, one must recognize that its strategy for the Strategic Banking System reversed decades of

Banc One, *page 94*

COMPUTERWORLD'S in R...G

About the award

Computerworld's first annual Excellence in Re-engineering award recognizes an organization's outstanding use of information technology to improve business processes or dramatically transform the way it does business. This year's winner was selected by a panel of *Computerworld* editors from more than 60 companies.

Files with faces: Banc One re-engineers

CONTINUED FROM PAGE 93

banking tradition, which focused on using computers to complete transactions.

"We want a system that gives us everything there is to know about that customer and incidentally does handle the transaction," says Donald L. McWhorter, president of Banc One and the visionary behind the system. "We decided we're in the information business, not the transaction business."



CEO John B. McCoy maintains that Banc One is in three mainline businesses: banking, acquisitions and technology.

Lots of big banks are scrambling to patch their disparate systems together to support "relationship banking." But what separates Banc One from the pack is that its Strategic Banking System is a "more elegant and comprehensive form of integration," says James Moore, president of Mentis Corp., a Salisbury, Md.-based research firm that specializes in banking technology.

The Strategic Banking System can deliver a complete customer profile, on-line, down to the branch bank's customer service representatives. Furthermore, it can produce a profile of the customer's whole household or of all customers who work for a particular employer, Moore says.

The big difference is simply that the power was "designed in from the beginning," explains Robert Barrett, president of IS subsidiary Banc One Services Corp., which has a $293 million budget and 1,650 employees. He credits McWhorter not only with having the original vision but also with "having the courage to stay with it, even in the face of some adversity along the way."

Six years ago, when it appeared that nothing on the commercial horizon could do the job, Banc One teamed up with about 200 programmers from Electronic Data Systems Corp. to undertake the daunting task of building the next-generation software. (Interestingly, the relationship was based on a loose contract in which EDS paid roughly 80% of costs in return for the privilege of being able to sell the resulting software to other banks.)

Bankers steer

EDS officials started out by grilling approximately 300 Banc One employees — bankers and other employees from all parts of the company — in roundtable meetings aimed at finding out what data they wanted for the banking system of the future. All told, EDS assigned 200 people to the mammoth project.

Linda Antrim, a Banc One marketing professional who managed the project in its first few years, says she was impressed by the hard-working Banc One volunteers who took time out of their regular jobs to attend the meetings for this data modeling exercise. She also praises Banc One's management for allowing its bankers to work on a high-risk project without fear of adverse consequences.

"Back in 1986, this was a brand-new and very challenging vision," Antrim recalls. "A whole bevy of similar projects [attempted by other companies] had failed, so we knew it was territory that had been covered before and not successfully."



President Donald L. McWhorter: The visionary who launched development of a revolutionary, customer-focused banking system. "We decided we're in the information business, not the transaction business," he says.

Banc One officials say their project succeeded where others failed because it had a clear mission defined by bankers, not technologists, and it had a project champion with real clout — McWhorter. However, like any re-engineering project, the Banc One effort had its share of pain.

The overhaul, bigger and more complex than anyone had imagined, ran about two years behind schedule. It faced the usual technical challenges of implementing client/server systems, including network management and reliability.

The first release of the customer information system was finished in 1989 and installed by Norwest Corp., a Minneapolis-based bank that also participated in the project. The second release is now in use at Banc One's branch banks in Marion and Mansfield, Ohio.

In essence, the Strategic Banking System is the key to Banc One's business goal of providing customized products and services. That's why officials are positively giddy over the system's ability to do such things as automatically send bank statements to someone's Florida condo address during the winter months only.

Next year, Banc One will be able to create financial products such as deposit accounts and loans — on the fly — for particular customers or regions just by changing the product's parameters on a PC, says Kristen Littell, a senior marketing officer.

Ordinarily, parameters such as interest rates and maturity dates are hard-coded in the banking software, so it takes a programmer to make changes. But Banc One is excited about the prospect of having bankers adjust the pricing of standard products to meet competitive pressures, as well as the ability to respond quickly when legislators or regulators change the rules of the game.

Personal pitches

The Strategic Banking System can hold a whopping 12,000 pieces of information on each customer, including data extracted from the mortgage and securities subsidiaries and demographic data bought from outside sources.

Armed with that electronic dossier, Banc One is well-positioned to develop highly targeted marketing campaigns, Littell says. For example, it can compile a mailing list of customers with $5,000 balances in their checking accounts and who might be interested in a high-balance savings account at a higher rate, she explains.

At a glance

Banc One Corp., Columbus, Ohio.

Assets: $48 billion.

Has expanded beyond its Midwestern roots through acquisitions.

Owns 62 banks with 1,008 offices.

Ranked No. 1 among peers and consultants in 1992 *Computerworld Premier 100.*

IS spending as a percentage of revenue: 7.1%. Industry average: 4.4%.

Banc One is known for its efficiency in absorbing the many banks it acquires. Its SWAT team of 150 conversion experts descends on new acquisitions and converts them to standard Banc One hardware and software overnight.

COMPUTERWORLD'S in

Winning Team

David M. Van Loar, past president of Banc One Services Corp. and now head of Banc One's regional bank affiliates group.

Linda Antrim, project manager in the early years of the Strategic Banking System project; now vice president of marketing and administrative services at Banc One Services.

Mitchell Zoellner, director of implementation and support for the new systems.

J. Terry Lowder, vice president of advanced technology at Banc One Services. Chief architect of the company's technology infrastructure.

Honorable mentions are no slouches

Computerworld's editors were also especially impressed by these re-engineering efforts:

■ **Eastman Kodak Co., Rochester, N.Y.** IS chief Candy Obourn's title says it all: As vice president of IS and business processes, Obourn has set out to move the company's core businesses to client/server computing and to re-engineer business processes along the way. Kodak recently began full-scale implementation of a software system that integrates order processing with manufacturing, financial distribution and operations [*CW Premier 100*, Sept. 14].

■ **Cigna Corp., Philadelphia.** This $66 billion insurance company's re-engineering effort was instigated by the top IS executive, J. Raymond Caron. Caron got a broad mandate to eliminate wasteful practices — whether or not they had anything to do with technology — and to turn a bloated bureaucracy into a responsive, data-driven business. The results are lower costs, fewer management layers and dramatically changing jobs [CW, June 22].

Even the IS department has been re-engineered and trimmed. By replacing 85% of its systems and reorganizing along team lines, Cigna has realized annual savings of $1.5 million and speedy delivery of information to line staff. For his re-engineering work, Caron recently won the Society for Information Management's Partners in Leadership Award.

■ **Bell Atlantic Corp., Philadelphia.** Bell Atlantic's Systems 2000 project is an ambitious, $2 billion project to completely rebuild some 400 applications supporting 120 business functions [CW, May 18].

Joseph T. Ambrozy, vice president of IS, has opted for more radical changes that will produce bigger benefits. For example, the company is replacing a 1970s-era hodgepodge of service-order systems with a network of Unix workstations for 6,000 customer service representatives — including an expert system to help them match available services and options with customer profiles [CW, Oct. 7, 1991].

■ **Levi Strauss & Co., San Francisco.** Consumers can't buy apparel that isn't on the racks, so Levi Strauss emphasizes paring product-delivery times to keep enough merchandise available to meet consumer demand — without piling up excess inventory.

This is accomplished via the LeviLink electronic data interchange system, which connects the company to its suppliers and trading partners [*CW Premier 100*, Sept. 14].

The progressive company is also undertaking a massive business re-engineering project to integrate U.S. operations with those abroad, and it recently developed its first client/server system for tracking shipments around the world.

Banc One Mortgage melts paper blizzard

Subsidiary replaces desk-to-desk processing with team approach

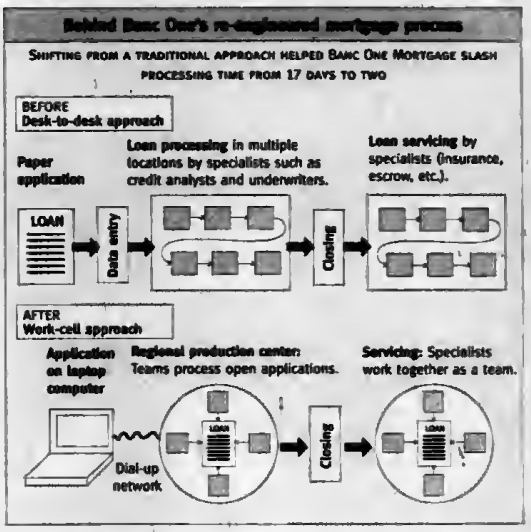


J. Albert Smith, president of Banc One Mortgage: His division's smart technology use helped re-engineer how mortgages are approved and serviced and boosted the number of loans written tenfold to more than 300,000 a year.

Banc One Mortgage is re-engineering both the front end and the back end of its business because "we've got to control the paperwork blizzard," says J. Albert Smith, president of the Banc One subsidiary.

Otherwise, he fears being snowed under as the fast-growing company moves from handling 33,000 loans in the past to 300,000 loans next year.

So Smith has scrapped the traditional desk-to-desk approach to processing mortgages in favor of a speedier "work cell" or team approach that gets the job done weeks faster than before. He is also adding a dose of technology to boost productivity and reduce paperwork.



Using laptops in the field has produced some side benefits, too. Loan originators can now call up prices and check on the status of the loan for a customer. In addition, "the laptop [software] forces the originator to do it right the first time, so that you get all of the information you need up front," Smith says.

On the front end, the sales force now uses laptops to transmit the loan application to regional production centers, where groups of loan analysts with various skills work as a team to approve the mortgage.

On the back end, after closing, another team of specialists sets up the loan for servicing. A process that used to involve eight departments and take 17 days now takes just two days, Smith says.

"We're eliminating the paper chase. Before, if you needed to get your hands on that loan, you didn't know where it was because it could be in eight or nine different departments," Smith said.

The next step is implementing a $10 million imaging system with work-flow software, which Smith says he expects will boost productivity at least 30%. That system will be completed in June 1993. — *Mitch Betts*

Opportunities for cross-selling abound with an integrated database. "The more you know about the customer, the more you can target them for a specific type of product pertinent to their financial picture or lifestyle," says Mitchell Zoellner, director of implementation and support for the system.

Obviously, customers who frequently overdraw their checking accounts are good prospects for an overdraft protection service.

"In nonintegrated systems, the information [about overdrawn accounts] would be kept on a separate system, and the banker may not be aware of that fact," Littell says.

Likewise, when customers apply for a car loan but their financial profile is ideal for an equity line of credit at a better rate, Banc One can steer them in that direction.

"It's critical that it's a win/win situation," Zoellner says, "good for them and more profitable for us."

More time for customers

For bank employees on the front lines, the beauty of the new back-office and branch automation systems is that they make the job less clerical and more sophisticated, says Jewell Beatty, vice president of personnel at the Marion bank. Instead of handling a lot of paperwork and typing information on forms, new-account representatives can spend more "quality time" with customers in hopes of closing a sale, she says.



Robert Barrett, president of Banc One Services Corp.: Power to combine scattered customer records was "designed in from the beginning." Barrett says he credits McWhorter for "having the courage to stay with it."

EDS is marketing the Strategic Banking System to other banks, but Banc One officials are not concerned about losing their competitive advantage. "No bank will ever know the software as well as we do. More importantly, the real competitive advantage is not the software," Antrim says, "but the way that bankers exploit that tool."

No one doubts Banc One will exploit its gold mine of customer data to boost profits and market share. "The real bang for the buck is yet to come," Barrett says — which means Banc One's competitors are in for a long, tough battle in the years ahead.

Consultants' corner

■ **Laura Jean Stuart, president of Stuart Research in Cambridge, Mass.:**
"At Banc One, the corporate culture is that the technologists think like bankers. And the bankers on the front lines know they have the technology support to find creative ways to serve their customers and look for new business opportunities.

"That's how Banc One Services Corp. contributes to bank profits — by helping to create happy customers and new business."

■ **James Moore, president of Mentis Corp. in Salisbury, Md.:**
"Banc One is innovative in branch automation. . . and has one of the best customer information systems.

"The senior management views technology as a competitive tool and they invest in it, not for technology's sake, but to get business results."

■ **M. Arthur Gillis, president of Computer Based Solutions, Inc. in New Orleans:**
"There is a connection between good bank earnings and good technology. Good technology gives them the capability to know their customers well.

"Out of the 55 biggest U.S. banks, there are 15 that excel in their use of technology, and Banc One is one of them. They are good, very good. Can't you guys [in the press] find someone new to write about?"

— *Mitch Betts*

Looking to start a re-engineering project?

For those of you thinking of beginning a re-engineering project, going to a conference is often a very good way to gather vendor information as well as glean war stories from information systems managers who have already trod the path.

One such upcoming show is the Downsizing Expo, slated to be held in Chicago Feb. 16 to 18, 1993. The show includes, among other forums, a complete miniconference on business re-engineering.

Scheduled speakers include Roger Burlton, an analyst at SRI Strategic Information Resources, Inc., who will keynote the event by talking on the challenges and megatrends of transforming business and IS processes.

Bruno Kierczak, the director general of the information services bureau at Public Works Canada, will talk about his re-engineering experiences.

In addition, a number of consultants will speak on topics ranging from cost justification of software redevelopment to effectively knocking down corporate culture barriers.

All these two

Can you [illegible] better, faster and

EDS helped Del Monte say yes.

Can record growth be sustained without compromising the service that helped to create it?

EDS helped Indiana National Life say yes.

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EDS was in the starting blocks for the 1992 Olympic Summer Games.

Once you're ahead of the competition, do you have what it takes to keep the lead?

EDS helped Smith's answer yes.

Can you in[crease] without increa[sing]

EDS helped the Indiana Dept. of Transportation answer yes.

Can you serve customers across the ocean as well as you serve them across the street?

EDS helped the Armed Forces Financial Network answer yes.

Can cities find sources of revenue other than taxes?

EDS helped Chicago answer a definite yes.

Using new applications of information technology, EDS is helping Chicago collect $420 million in unpaid parking tickets. In less than a year, annual ticket revenues have increased by 50%. Plus, revenue has nearly doubled from parking meter collections.

Because drivers now take parking tickets that they receive more seriously, traffic flow has improved measurably throughout Chicago. According to Chicago officials, the whole [illegible]

Can better technology really translate into better products and better sales?

EDS helped Prime answer a resounding yes.

Using sophisticated Computer-Aided Engineering (CAE) technology from EDS, Prime Manufacturing has created the most reliable workstation on the market. It's called the Prime [illegible]

Computer-Aided Engineering is a computer-aided design and manufacturing system based on open-architecture technology that speeds up the design process. With it, Prime can train customers in different regions to design to the exact specifications of their customers' own local design standards. And used by sales people can more than [illegible] in days as a result.

Prime can get its new and better products to market a lot sooner. Engineers at its Natick, Mass. center and resellers have been [illegible] selling. And Prime makes data [illegible] already 20 percent higher than Prime's own best-selling minicomputer.

"In the highly competitive systems integrator industry we create the tech[nology] to improve the quality of our products," says Steve Dawes, Director of Research and Development at Prime. "A significant percentage of the improvement found in our Computervision [illegible] our customers today can be credited to using EDS Unigraphics."

New technology can improve your products while also improving your business. For EDS is the world leader in applying information technology. To find out how we could help you, write Peter Alkire, EDS, 7171 Forest Lane, MS[illegible], Dallas, Texas 75230. Or call (214) 490-2000, ext. 125.

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organizations have things in common.

Each achieved outstanding results. Each with the help of information technology from EDS.

Jackson National Life grew 750 percent in just six years with the help of systems developed by EDS that streamlined administration and made the company much more responsive to customers.

Chicago improved traffic flow and is collecting $420 million in unpaid parking tickets with the help of hand-held computers and up-to-date imaging technology. EDS helped develop and implement the systems.

The **Armed Forces Financial Network** provided service personnel access to their finances from virtually any U.S. military base through a global EDS ATM network.

Smith's Food & Drug Centers expect to double productivity thanks to EDS systems which support all aspects of the retailer's operations.

Prince Manufacturing now makes product design changes in days instead of weeks thanks to the EDS Unigraphics® CAD/CAM system.

The **Indiana Department of Transportation** saved millions of dollars and increased the productivity of engineers 60 percent. EDS's client/server-based Graphic Data System was the key.

Results like these have helped EDS become the world leader in helping organizations apply information technology effectively. To find out how we could help you, write Peter V. Abene, EDS, 7171 Forest Lane, M59, Dallas, TX 75230. Or call (214) 490-2000, extension 159.

Results and EDS

Intelligence Files

60-second briefing: Buying technology

Growth of new channels

"The days of having large-account representatives opening up new sales are gone. Very few companies can afford on-site sales.

"IS people are going to have to be more comfortable with intermediaries, such as integrators and consultants.

"Because of the advent of client/server, you will see a dramatic distribution shift as companies find different channels of distribution that work from a profit standpoint. These include direct mail, catalogs, telemarketing, software resellers."

Impact on service

"There is no reason to have a hardware maintenance contract. But client/server systems are not as robust as mainframe applications, so software maintenance is still necessary."

Fewer vendor choices

"There is a significant decline in outside companies buying into the computer industry, as well as less diversification within the industry. With these short product cycles, they have to stick to something they understand."

A mini-interview with Paul Deninger, managing director at Broadview Associates. The Fort Lee, N.J.-based investment banking company has specialized in information technology acquisitions and mergers since 1973.

Global outsourcing

Farming out information processing to contractors in foreign countries has become a small but rapidly growing portion of the outsourcing market.

India, Singapore, the Philippines and Ireland are among the countries with low-wage, well-trained, English-speaking labor pools that can provide data entry, programming and transaction processing at low costs.

However, the remote locations make project management and quality control more difficult. In addition, the notion of exporting jobs could raise big political problems in the U.S.

Source: "Global Outsourcing of Information Processing Services," a paper by Uday M. Apte and Richard O. Mason at Southern Methodist University, presented Nov. 4, 1992.

Fed-up decision-making

"Most companies send people to all the outsourcing conferences, and read all the magazine articles, and hire pricey consultants — but they still make their outsourcing decisions like this:

"One day something happens — one crisis too many or one dollar too far over budget for the umpty-umpth time in a row — and the CEO says, 'OK, I've had it: Get IS out of here. Let somebody else do it.'

"And once they make the decision to outsource because the boss is fed up with worrying about IS, most of them put aside all the impressive philosophy they've learned from the seminars and the articles and the consultants and go with the bidder that gives them the best price."

Source: Information systems director attending a monthly luncheon meeting of the Boston area chapter of the Society for Information Management, Nov. 13, 1992.

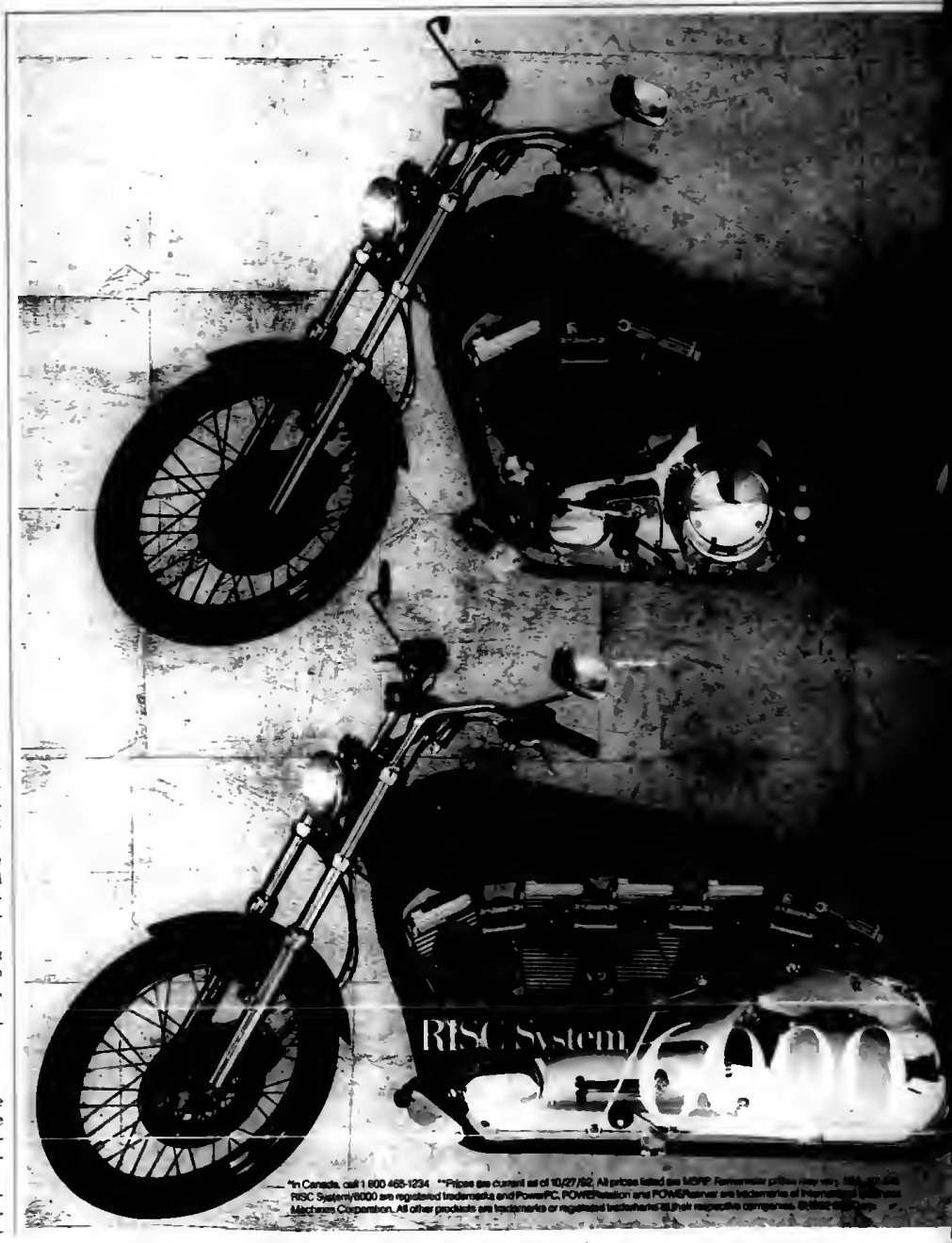
Why the CFO says 'no'

The majority of proposed document-imaging projects were turned down by chief financial officers because the proposals failed to generate an adequate return on investment. Are CFOs just myopic, bean-counting Luddites?

No, the problem is that the proposals were not revolutionary enough. The rejected imaging proposals would simply have streamlined existing processes, producing a small financial return. If the applications had redesigned those processes to achieve not only cost reduction but also revenue enhancement, they would have received the CFO's approval.

Source: "CFOs turning thumbs down on ill-conceived imaging," by Thornton May, *Imaging World*, October 1992.

Compiled by Computerworld *national correspondent Mitch Betts, senior editor, management Nell Margolis and associate editor, management Carol Hildebrand.*



*In Canada, call 1 800 465-1234. **Prices are current as of 10/27/92. All prices listed are MSRP. Reseller prices may vary. RISC System/6000 are registered trademarks and PowerPC, POWERstation and POWERserver are trademarks of International Business Machines Corporation. All other products are trademarks or registered trademarks of their respective companies.

Calendar

JAN. 10 - JAN. 16

Software User Documentation: Designing for Usability. Orlando, Fla., Jan. 11-12 — Contact: Digital Equipment Corp., Marlboro, Mass. (508) 467-6910.

Electric West '93. San Diego, Jan. 12-14 — Contact: The Fairfield Factor, Inc., Brookfield, Conn. (203) 775-0422.

Redundant Arrays of Inexpensive Disks Advisory Board Meeting. Sunnyvale, Calif., Jan. 13 — Contact: Joe Molina, Technology Forums, Lino Lakes, Minn. (612) 704-2379.

JAN. 17 - JAN. 23

Retailing 1993: A Turning Point. New York, Jan. 17-20 — Contact: Retail Services Division, New York, N.Y. (212) 244-8780.

The Canadian Software Re-engineering and Maintenance Conference. Toronto, Jan. 19-21 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Outsourcing Conference '93. Dallas, Jan. 22-23 — Contact: Frost & Sullivan International, New York, N.Y. (212) 233-1080.

JAN. 24 - JAN. 30

Marketing the IS Organization Internally. Atlanta, Jan. 26-27 — Contact: Oulette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

JAN. 31 - FEB. 6

Downsizing Corporate Information Systems Conference. London, Feb. 1-2 — Contact: Amanda Stuart, IBC Technical Services Ltd., London, England (011-071) 637-4383.

Object World. Boston, Feb. 1-4 — Contact: Lynn Fullerton, World Expo Corp., Framingham, Mass. (508) 879-6700.

Image World West. San Jose, Calif., Feb. 1-5 — Contact: Benita Roumania, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Comnet. Washington, D.C., Feb. 2-4 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

FEB. 7 - FEB. 13

1993 User Data Management Systems User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 987-1001.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Expo Comm Mexico '93. Mexico, Feb. 9-12 — Contact: Ben Stauffer, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

FEB. 14 - FEB. 20

1993 Symposium on Applied Computing. Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Mobile '93 Conference and Trade Show. San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

FEB. 21 - FEB. 27

SynOptics Users Group Conference. Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.



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Product Spotlight: Windows utilities

SOMETHING *for* everyone



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FOR DEVELOPERS

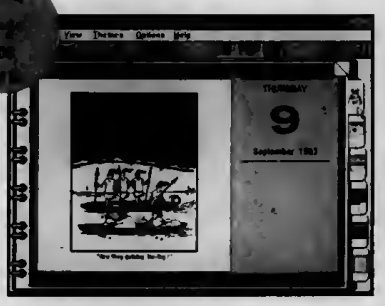
DEVELOPERS

- Simplifying development
- Diagnosing problems
- Optimizing applications

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MANAGERS

- Configuration
- User setups
- Software maintenance
- Network monitoring



By Todd Henschell

I like Windows, but I don't like icons — and I'll tell you why. And no, I'm not trying to have it both ways when I say that.

Most folks over the age of 12 started computing with a system that booted up to some flavor of DOS. Many of us don't want to work with software that looks like it should come in a cartridge and be played on a television with a joystick.

The good news is, you don't have to dig through teensy pictures of cute file folders to get your work done with Microsoft Corp.'s Windows. You can ignore most of what Microsoft includes in the package. But you'll need a suite of good utilities.

There's a problem with many Windows utilities: They forget that the point of even having this monster on your hard disk is that the software is supposed to be easy to use. A program that asks me to remember that a disk with an arrow pointing to the left means "open file," and a disk with an arrow pointing to the right means "save file" has missed the point.

For the icon-phobic

This is even more critical in utilities. If you have a disk with an error you want to fix, the difference between FORMAT DISK and CHECK

Utilities, *page 103*

ALSO . . .

- Shareware
- Wish list
- Mega-utilities

Henschell is a PC consultant and free-lance writer (and icon-phobe) in Burbank, Calif.

Windows utilities

Why so many utilities?

By David Rorabaugh

THERE ARE SO MANY Windows utilities on the market that you might start to wonder whether there are deficiencies in this environment that require utilities.

Some of the bumper crop of Windows utilities do fulfill features that Microsoft Corp. should have included in Windows. However, Microsoft also chose to leave some features to third parties to ensure the health of the aftermarket utilities business.

The fact is, no operating environment can suit every user, manager or developer. Windows encourages these differences because the system can support a great number of utilities. In DOS, you can only load so many terminate-and-stay-resident (TSR) programs and device drivers before running out of memory or encountering conflicts between programs.

That — combined with the fact that the operating system is more complex than DOS — has resulted in a greater demand for utilities.

There are also many users who have switched to Windows from DOS and want to replace their old DOS utility programs. Unfortunately, it's generally believed that the overall quality of Windows utilities lags behind the quality of utilities in the DOS world.

It's not an entirely fair assessment, however; the two markets are at different stages of maturity. As Windows ages, the quality of applications and utilities will improve, while the time between major revisions lengthens.

Windows also presents a new level of opportunity for utilities. In DOS, utilities demand control of your system or remain resident in memory so you can pop them up over your application.

Many can run at once

In Windows, things are very different. Multitasking turns every program into a TSR, giving the user all of the benefits with none of the associated problems. Virtual memory makes it practical to run many programs at once, while Dynamic Data Exchange allows the programs to talk to one another. Dynamic Link Libraries allow programs to be extended with different functions.

I believe the best and most effective utilities are those that add to or enhance the environment rather than replace parts of it. For instance, programs that add options and functions to Program Manager or File Manager (see box at right) rather than simply replace one or the other are far more elegant than reinventing the wheel.

Why is this important? In Windows, many programs presume you are using Program Manager and not something else as your shell. If you are using another shell, various applications may not install properly. This is usually at the stage where the errant program tries to create a new Program Manager group and receives an error message instead of an acknowledgment.

There are many categories of utilities, and shareware utilities should also be considered. Shareware, designed to let users try a program for a few weeks before paying, often includes the brightest utility gems, though the commercial packages dominate the market. •

Rorabaugh is network systems manager at LTS Corp., a consulting firm in Rosslyn, Va. He can be reached on CompuServe at 76376,3423.

What's a utility, anyway?

Utilities have generally been defined as system- or service-related programs, while applications are business or scientific programs. These definitions are dated in our new world, where the critical mass of computing power drifts toward the desktop. Let's try this:

A UTILITY is a small or narrowly focused program.
AN APPLICATION is large or broadly focused.

Of course, there are variations within any set of categories, and this is confounded in a multitasking environment such as Windows. So let's add two other categories:

MEGA-UTILITIES are collections of utilities that approach the size and breadth of applications.
MEGA-APPLICATIONS are collections of applications that are integrated to function as a unified whole.

Into this semantic muddle we have to throw another word:

"APPLET" is Microsoft's category for the utility programs and small applications included with Windows.



Windows components

Following are the default programs of Windows. In Version 3.1, Microsoft built the first two to be extensible so that more functions and features could be added through utilities built by third-party developers. However, some utilities are actually replacements for — not extensions of — the program.

Program Manager is the default shell of Windows and graphically presents programs in logical groups. It is the "shell" from which other programs are started.

File Manager provides a file and directory tree-based display of the contents of local or network drives. Along with Program Manager, it provides the foundation on which Windows (by default) is built.

Task Manager is a sort of "agent" that pops up on demand to tell you what programs are running and lets you arrange them, switch between them or shut them down.

Self-reliance is the goal



There are bundreds of utilities that provide users with amusing or entertaining accessories, but these won't necessarily make them more self-reliant. Here are some major categories of Windows utilities that will make your end users less dependent on you.

MEGA-UTILITIES

These utility suites are perfect for users who need an immediate jumpstart and don't have the time to build their personal tool kits. They're also useful for people who function best when immersed in a comfortable, integrated environment.

Norton Desktop (Symantec Corp.)
Norton Desktop for Windows (NDW) insulates users from Windows File Manager and Program Manager. Because it replaces both of these programs with a unified desktop application, there will be a learning period; these are not just minor enhancements.

Beyond all the file and program management tasks, NDW also adds a program launcher, a file viewer, a file finder, a desktop editor, a complete macro language, several calculators, a scheduler, a screen saver, several disk utilities, antivirus protection and an icon editor.

Amish Utilities (Amish Software, Inc.)
This is a smaller collection of individual utilities and therefore doesn't require as deep a commitment as NDW in changing the way users work. It includes a program launcher, a desktop/screen expander, an ASCII/Hex file viewer, a Post-It style memo pad, an enhanced clock and a memory monitor.

FONT GADGETS

Because Windows 3.1 provides TrueType support without any additional software, many users are now being exposed to the world of typography for the first time.

Many users will want to convert their fonts from their DOS applications, and many Windows 3.0 users may want to convert their ATM PostScript fonts into TrueType for use with Windows 3.1. Others may want to add corporate logos, add special characters or make small caps or foreign characters easier to use.

Font Monger (Ares Software Corp.)
If your users understand type, this product is probably a good place to start. Font Monger allows you to convert fonts between different types of formats, reassign key mapping and add custom characters.

AllType (Atech Software)
This is a good choice for users who don't understand fonts but need to use them with multiple applications. AllType doesn't offer significant font editing tools, but it does offer a wealth of conversion and installation features.

Printers Apprentice (Lose Your Mind Development)
Printers Apprentice is a wonderful utility for examining fonts, printing samples and spec sheets and generally getting to know your catalog of type. It's good for exploring and documenting your catalog of typefaces and learning a bit about what's lurking in there.

GRAPHICS

Windows supports a plethora of graphic file formats, and users often need to convert these among different programs. Often, a simple task may require special utilities. The Paintbrush program is good for basic pix-

Windows utilities

For the icon-phobic

CONTINUED FROM PAGE 101

DISK is crucial. Click the wrong picture and your data is history. You would *never* select FORMAT DISK if it were spelled out, but what does a green disk mean? Does it mean GO or FORMAT? Beats me.

In my Windows software travels (I've been a daily user since Version 2.11, and I live there 24 hours a day now), I've bumped into a few gems. There's also a lot of garbage that passes for software. Let me tell you about both categories.

For most companies, Program Manager, the default Windows shell, is "it." It's free, ships with Windows, and it sort of works. Too bad, too, because it's a lemon. Windows boots up, and lo and behold, the user who once pressed F2 to load an application is presented with this collection of colorful doodles. The user has to find the application's icon, which may be hidden behind other icons, scrolled off the program group's screen, etc. (And yes, I know about hot keys in Program Manager, but that's not my only objection to it.)

More like DOS

Command Post from Wilson WindowWare, Inc. fixes this problem. It makes Windows more like DOS, in that you get to read what you're doing. It's text-based and plain, but under the hood it's the most powerful add-on you can find for Windows.

Command Post lets you create an essentially unlimited number of menu items. You can have a program on your menu, written in the language of your choice, that will launch with a single click. You want WordPerfect? Click WordPerfect on your menu. No pictures, no hunting and no generic or identical icons.

One of my most-used utilities is Central Point Backup from Central Point Software, Inc. I evaluate a lot of software, some of which ends up mangling my Windows configuration. I get the pleasing chore of backing up and restoring a lot of data, and this product has never let me down.

The interface is elegant and simple and requires two mouse clicks (or a few keystrokes) to get it going. If you have enough horsepower, it'll run in the background and write to your tape backup while you work. It's a perfect example of how to do a Windows file management or system utility.

Only disk utility

Becker Tools 3.0 from Abacus Software is another useful tool. This collection of utilities can fix most minor floppy disk errors and format or copy floppies in the background and is generally a good thing to have around.

It's a bit quirky, but the product does what you tell it to. Currently, it's the only real disk utility for Windows I've come across.

Xtree for Windows from Xtree Corp. was touted as being the ticket for Windows file management. I know Xtree for DOS like the back of my hand, and I eagerly awaited Xtree for Windows. Guess what? None of the keystrokes mirrored the DOS version, and for no good reason. I bought it and returned it the same day. That was probably one of the saddest days in my computing life.

As for Symantec Corp.'s Norton Desktop, I'm sure I'll stir up a hornet's nest when I say that this multimegabyte heap of swirling icons isn't worth the hard drive real estate it hogs. It's fine if you want to do things such as drag a file to a picture of a printer — but most folks can figure out File Print just fine.

When you're using the Windows default shell, it can cause install programs to fail. If you have the undelete tracking installed, you can end up with megabytes of hidden files if the program crashes, and it makes the already sluggish loading Windows crawl off a fast hard disk.

What's missing?

If you've already moved to Windows, you'll notice right away there are some utilities that have no Windows counterparts. There is no Norton Utilities for Windows (although Central Point is working on PC Tools for Windows). There are no disk optimization tools, either. We also need a file manager such as Xtree (DOS version) that's not a drag-and-drop circus.

Many of us use Windows because we like the true representation of printed output — but we don't want to keep grabbing for our mouse. Utilities that migrate from DOS to Windows should keep the keystrokes they use now but add the slick features of Windows applications, such as file viewers, great printed output and so on.

Windows or something like it will eventually come to your system — whether you're eager to have it or not. Because this is where we're headed, why not insist on software that does what we want it to do once we get there? ▪

Silly software



Just because I don't like icons doesn't mean I don't want to enjoy myself when I use Windows. Garry Larson's Far Side Calendar 2.0 from Amaze is worth the hard disk space it occupies. Not only does it throw flying pterodactyls across your screen at unpredictable times, but it's actually a first-rate contact management and appointment book.

Also, Makeover from Playroom Software provides something Windows lacks: good looks. It's a shareware product that allows you to fully control every aspect of Windows' appearance. This includes changing the radio buttons if you'd like them to read UP and DN instead of having little triangles that point. — *Todd Henschell*



Directory

Vendors mentioned in this article include the following:

Abacus Software
Grand Rapids, Mich.
(616) 698-0330

Amaze, Inc.
Kirkland, Wash.
(206) 820-7007

Central Point Software, Inc.
Beaverton, Ore.
(503) 690-8090

Playroom Software
Charlotte, N.C.
(704) 536-3093

Wilson WindowWare, Inc.
Seattle
(800) 762-8383

el editing, but it is severely limited when it comes to manipulating the image as a whole.

While there are several commercial programs to do this, the two that stand out most visibly are shareware products. The price of these two products combined is about 10% to 15% of what each of their commercial competitors costs.

Paint Shop Pro (JASC, Inc.)

Paint Shop Pro includes an impressive list of supported graphics file formats. It offers many options beyond format conversion.

WinGIF (SuperSet Software)

WinGIF allows the user to load and save graphics files in several formats — with several flavors for each file format. The editing commands allow resizing, scaling, clipping, dithering and cropping of images.

EXTENSIONS There are many programs that extend (rather than replace) File Manager or Program Manager.



Task Manager is a Windows component that many users never see. Rather than replace File or Program Manager, some opt to replace Task Manager, turning a simple task switcher into a versatile and complex management tool. This reflects an innovative approach.

Plug-In (Plannet Crafters, Inc.)

Plug-In adds several time-saving features to Program Manager, as well as visual enhancements. For instance, while Program Manager uses the same icon for each program group, Plug-In lets you use different custom icons for each group.

XTree (XTree Co.)

The granddaddy of the DOS world has migrated to Windows. Although it leaves several key features of the DOS version behind, the new Windows utility is worth a look, especially for the faithful.

File Commander (Wilson WindowWare, Inc.)

File Commander is best when used with the embedded Windows Interface Language, which is essentially WinBatch, another Wilson WindowWare product. File Commander gives you a configurable and versatile set of extensions; it's more of a File Manager extension tool kit than an extension because the interface, menus and options can all be completely redefined using the Windows Interface Language.



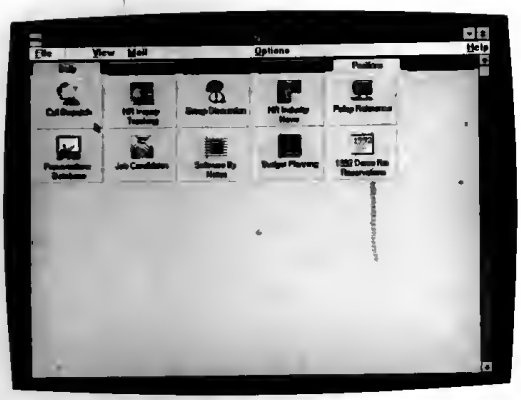
For a full list of Windows utilities, try "The Windows Shopper's Guide," a directory of products and services. For more information, contact: Whitefox Communications, Inc., P.O. Box 7125, Beaverton, Ore., 97007 or call (800) 669-5612.

Metz Task Manager (Metz Software)

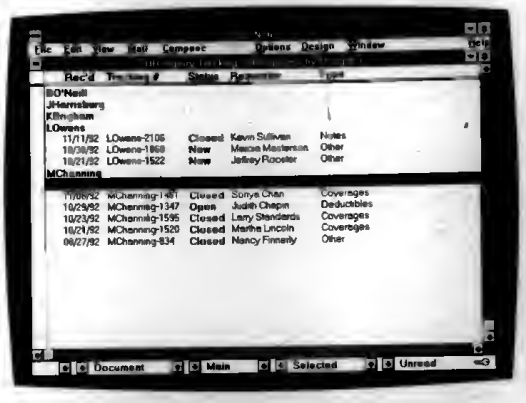
Metz Task Manager is by far the most elegant utility covered in this article. It provides immediate access to your Program Manager groups, quick launch and run options and a number of simple tools for managing the appearance of your desktop appearance.

By pulling so many features into one location without sacrificing existing skills, Metz Task Manager accelerates switching between applications. Some users may use this as a very quick task switcher, and some may prefer it to Program Manager.

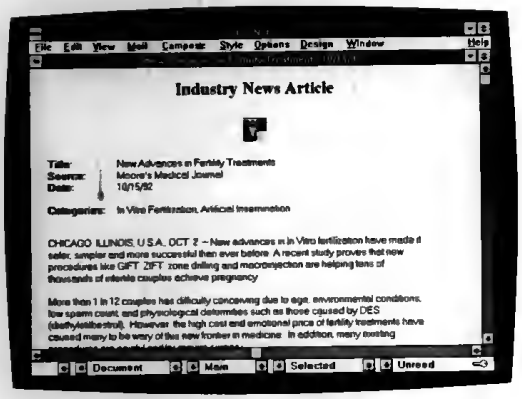
— *David Rorabaugh*



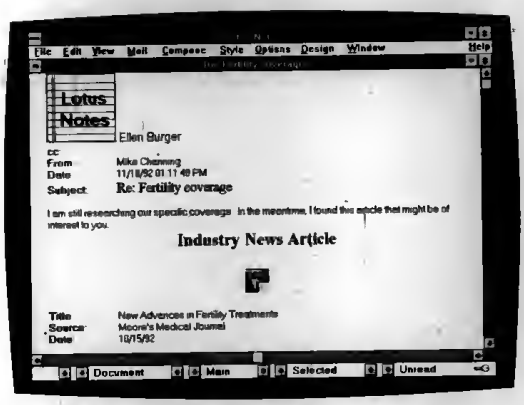
1. This is Mike's Notes desktop. Each icon represents a different database. In the course of the day, he generally uses them all. To start the day, Mike decides to check if any new benefits questions have been forwarded his way. He double-clicks on the CALL DISPATCH database icon.



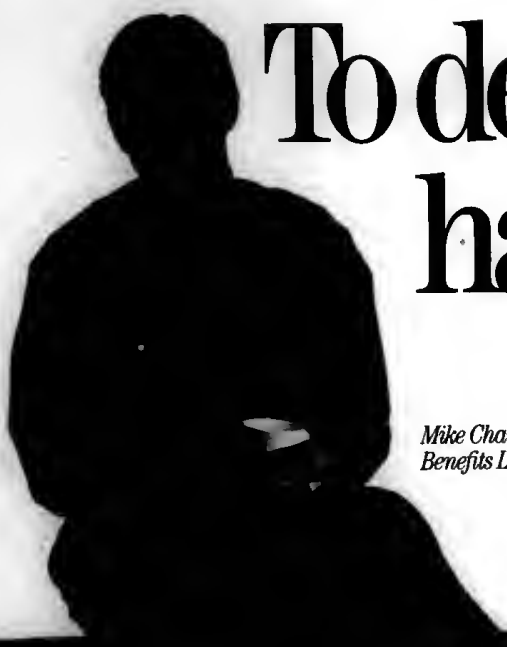
2. Well, there's one that hasn't been read. Ellen Burger has a question about her coverage. Ellen called the company's BENEFITS HOTLINE. The operator entered her query into Notes and it was automatically routed to Mike. Mike double-clicks to find out what the problem is.



5. He simply double-clicks INDUSTRY NEWS, and searches two categories: In vitro fertilization and artificial insemination. First up is a recent story from Moore's Medical Journal. Since the article includes authoritative information, he decides to forward it to Ellen.



6. Mike quickly composes a note, attaches the article and sends it directly to Ellen. That done, he gets himself a cup of coffee.



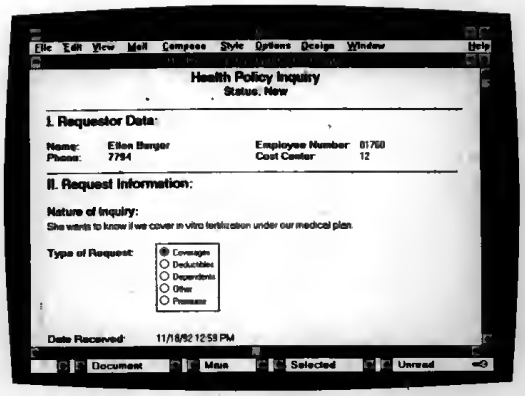
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Mike Channing
Benefits Liaison

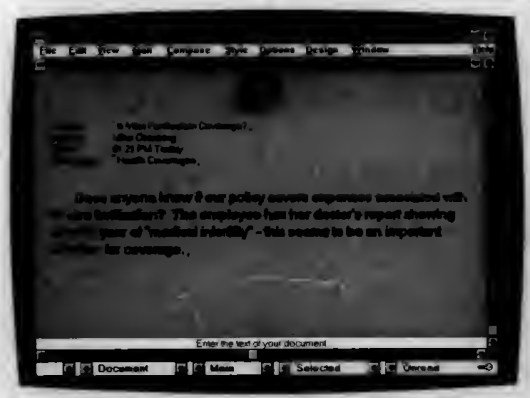
According to critics, including our competition, Lotus Notes® is one of the most exciting software products you can buy. We'd like to show you why.

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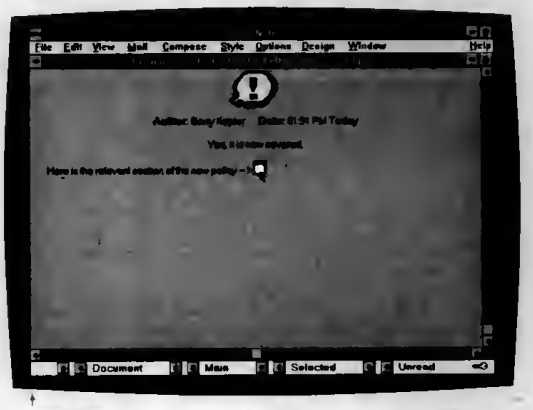
Let's watch how Mike Channing uses it: As a tracking tool for customer service. As a conferencing system for collaborative problem solving. And as a library for policies, documentation or news.



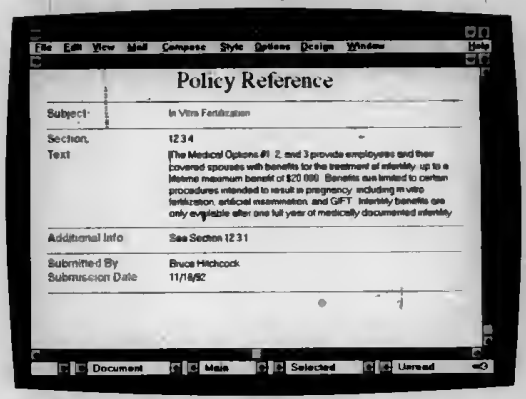
3. Up comes the inquiry screen. Ellen wants to know if the company covers in vitro fertilization. Mike, being new, is stumped. He calls his supervisor on the phone for the answer. He's not in yet. Instead of waiting, Mike decides to post the question on the GROUP DISCUSSION database, thinking that someone else might know the answer and respond more quickly.



4. He double-clicks the GROUP DISCUSSION icon. Once in GROUP DISCUSSION, he poses the question to his workgroup. Eager to help, Mike then decides to check out the INDUSTRY NEWS database for any background information that might be useful to Ellen.



7. When he gets back to his desk, Mike checks back into the GROUP DISCUSSION database for responses. Not only has Barry Kepler responded with the answer, Barry actually leads Mike to the relevant section of the corporate policy manual by creating a direct link to the document.



8. Mike clicks the DIRECT DOC LINK icon. Up comes the relevant section of the policy. Mike jots a quick message and forwards both to Ellen. Job done, in less than 10 minutes, by easily tapping into expertise both inside and outside the company.

e power of Notes, we example of Mike.

Watch how Notes organizes information so it's easy for Mike to get the answers he needs. How effortlessly he taps his workgroup's knowledge. How quickly he accesses conventional references. Now you can see why people who have Notes build their work around it. And why the companies that have installed Notes have seen as much as a 400% return on their investment.*

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Lotus Notes

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Windows utilities

Simplify, diagnose, optimize

These functions are critical to Windows application developers

By Jeff McGroary

FOR DEVELOPERS

Amid all the software development activity surrounding Windows has emerged a growing need for developers' utilities. Three types are most important to the Windows applicatioo developer: utilities for simplifying the development process, diagnostic utilities and system and application optimization utilities.

Windows developers can generally be divided into two groups: those that use the Microsoft Corp. Windows Software Development Kit (SDK) and the C/C++ 7.0 compiler; and those that use Borland International, Inc.'s C++ and Application Frameworks environment.

Accordingly, we've chosen to focus o n the utilities included in those tool kits.

Simplifying development

To assist in the development of the oser interface, the Microsoft SDK provides three atilities:

- **The Dialog Editor**, which is used to construct and lay out dialog boxes.
- **The Image Editor**, which allows the developer to create and modify cursors, icons and bitmaps.
- **The Hotspot Editor**, which helps create Hypergraphics. These are used in the Help system to provide links to related topics or to display more information on a given topic.

Borland provides the equivalent functionality in a single utility: the Resource Workshop, which allows the developer to compile a project's resource file, a separate utility in the Microsoft SDK.

Borland's Resource Workshop is also sold as a separate produet and can be used in place of the Windows development utilities.

Making diagnoses

Given the complexity of the Windows multitaskiog, event-driven environment, developers absolutely need utilities that allow them to get some glimpse of "what's going on in there."

Microsoft provides several glimpses. CodeView is one. It allows developers to trace through problem code to track down the source of an error.

Another is Dr. Watson, which often clues you in to which section of code caused the problem. This utility deserves some of the credit for greatly reducing the frequency of unrecoverable applicatioo errors under Windows 3.1.

Two other useful diagnostic utOities provided by Microsoft are Spy and DDESpy, which allow developers to "spy on" eveots their applications are receiving.

Borland provides similar diagnostic utilities, although they are osed somewhat differently.

The Borland equivalent of Microsoft's CodeView is Turbo Debugger. While Microsoft provides Dr. Watson to diagnose a sick Windows application, the Borland folks have a doctor of their own: Dr. Frank.

When Borland developers need to spy on on their Windows applications, they make nse of the Borland event monitoring utility WinSight.

Shareware

The best sources for shareware are the commercial information services. Local bulletin boards have a lot to offer, but none offer the sheer volume and instant accessibility of the CompuServe information service. The following forums are a good source for Windows shareware and freeware utilities:

BEKL: Microsoft's language forum. Will locate Microsoft Systems Journal articles and files.

BORPWIN: Borland's C++/Windows forum.

WINDEV: Microsoft's Windows Developers' Forum.

System and application optimization utilities

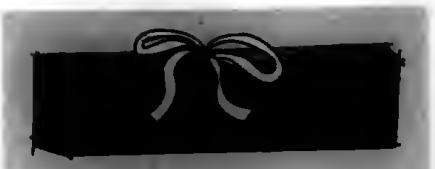
The final step in the development process is application optimization, which is especially important in the Windows operating environment. A poorly designed, inefficient Windows application can adversely affect the performance of the entire Windows workstatioo.

Both Microsoft and Borland provide an application profiling utility. Microsoft's is called Profiler, while Borland's goes by the similar title of Turbo Profiler. These utilities gather runtime information regarding the performance of an application and identify frequently accessed code segments.

The Windows utilities provided by the Microsoft and Borland Windows development packages are certainly the most frequently used Windows utilities, but they're by no means the only utilities available to developers.

There are literally hundreds of Windows utilities available from a variety of sources. They range from MicroQuill, Inc.'s widely used, very sophisticated (and expensive) Segmentor application optimizatioo utility to freeware found on CompuServe and other computer bulletin boards. •

McGroary is a consultant at The Aristos Co., a Windows and OS/2 consulting firm in West Hartford, Conn.



Developer tools

Here is just a very brief sampling of vendors of new and widely used Windows utilities for developers:

Abacus Software
Grand Rapids, Mich.
(616) 698-0330

Borland International, Inc.
Scotts Valley, Calif.
(408) 439-1411

MicroQuill, Inc.
Seattle
(800) 441-7822

Microsoft Corp.
Redmond, Wash.
(206) 882-8080

PC-Kwik Corp.
Beaverton, Ore.
(800) 274-5945

Resolution Group, Inc.
San Diego

Make your life easier

By David Rorabaugh

FOR MANAGERS

Several utilities packages have special relevance for information systems managers and administrators. These provide control over configuration, help in setting up and maintaining user software or help to configuring and monitoring the network.

These utility packages can not only make your life easier but also shield your users from some potential complexities.

WinLogin

WinLogin from Microsoft Corp. helps managers deal with users who move from one system to another hut still want to have the same individual settings on whatever machine they use. While WinLogin takes a hit of work to set up and maintain — and many managers are likely to expect more from it than it delivers — it is worth a look. Its scope is narrow, hut you may find it a remarkable value.

Winstall

Aleph Systems' Winstall 2.0E is a complete, configurable system for enabling end users to install (and remove) their own Windows applications with a simple click of the mouse. For the manager who needs to make frequent changes to multiple user configurations, Winstall can be a lifesaver.

Net Tools

Automated Design Systems has been in the Windows networking market longer than any competitor. This longevity shows in the quality of its product, Net Tools.

Net Tools is a mega-utility for network managers and users. it contains several modules, including a network-aware scripting language, security features, menus, application monitoring and exemplary print management. Many network managers treat it as a grab bag, with most using a different combination of the various types of modules.

Automated Design Systems' product is priced for a full network installation, which may be high for small networks.

NetWare Tools

As part of its DOS/Windows Client Kit, Novell, Inc. has made available a group of ntilities named NetWare Tools. These Windows "applets" help monitor users and disk space, send and receive messages and work with some printing tasks.

While the provided utilities won't replace the features of SYSCON or PCONSOLE, they do provide the manager with a quick window oo the network and are very much worth installing. •



Manager tools

Vendors cited in this article include the following:

Aleph Systems
Takoma Park, Md.
(301) 270-4458

Automated Design Systems, Inc.
Atlanta, Ga.
(404) 394-2552

Novell, Inc.
Provo, Utah
(801) 429-7898

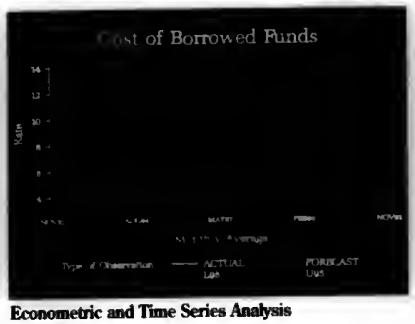
Where are you headed with your applications development?



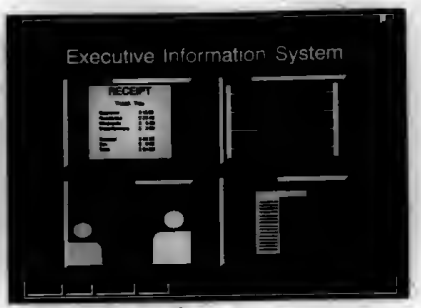
BACHMAN



Financial Planning



Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



Computer Performance Evaluation

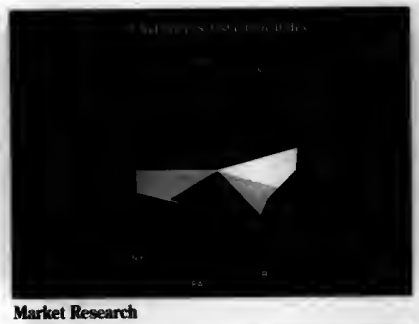
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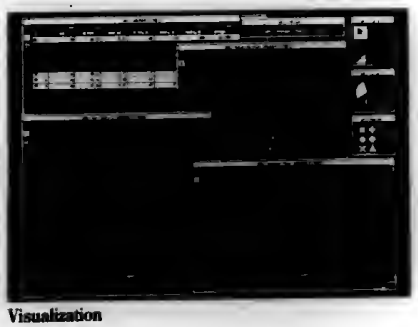
Reporting



Market Research



Business Graphs



Visualization



Data Analysis



Project Management

Quick & dirty

The long process of creating detailed software can be a waste of time. A better idea is to deliver a basic working system quickly and grow it to meet user desires. Such rapid evolutionary development improves software quality and flexibility, reduces cycle time and promotes innovation.

By Lowell Jay Arthur

Rapid evolutionary development describes the rapid prototyping and ongoing evolutionary processes needed to create and grow software quickly. With such processes in place, you can begin to measure and improve software quality and productivity.

In some beliefs, everything began in Genesis. God created the world in six days and rested on the seventh. Everything else occurred through evolution. Genesis is an excellent model for rapid evolutionary development because we want to create s deliverable, lunctioning prototype in as little time as possible, take s deep breath and begin the endless additions, changes and deletioos required to keep the system in balance and evolving to meet the needs of the business.

Notice that in Genesis, God didn't create a prototype, show it to users and then tell them they would have to wait 15 million years for the real thing. God created the basic working model that contained pairs of opposites — heaven and earth, ground and water, light and dark, man and woman — which provided balance. God obviously has a very binary mind. In Genesis, the earth was crested quickly. Its current state came about through evolution.

Rapid evolutionary development relies on speed, simplicity and a shared vision to create a desired product. It emphasizes reuse of data, program components and parts. In rapid evolutionary development, prototypers create a basic working system that does not contain all the variety the customer ultimately desires but that does work and provides the essential, initial elements of the system.

Once the information systems staff installs a basic working system and turns it over to the customer, a series of step-wise improvements — evolutions — turns the system into the customer's desired paradise. Sounds like a utopian, fantasy, doesn't it?

Quick & dirty, *page 110*

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Continued from page 109

And it's much more likely to occur this way than through most "construction" or manufacturing methodologies, which rarely evolve to meet the changing needs of the business or technology. Can you imagine what would have happened if God had tried to specify the requirement for this earthship and then built it from scratch, with all the bells and whistles? It could have taken 150 million years just to get started. Instead, God chose to rapid-prototype the initial version in six days and grow it from there.

Unlike the traditional development life cycle, speed is required more than direction in rapid prototyping. Once you're rolling, you can change course at will. If you're not moving, you have no feedback to guide your first steps.

God obviously has a very binary mind

The waiting game

Imagine walking into a car dealer's showroom and seeing that perfect red sports car you've always wanted. The salesperson takes you for a test drive and it feels like a dream. It corners like it's on rails, and the acceleration is second to none. You know that in this car, you'll feel unstoppable, on top of the world. This car is everything you've ever wanted.

You say, "I'll take one," and the salesperson says, "I'm sorry, this is only a prototype, but I can have one ready for you in 24 to 36 months." How would you feel? Disappointed? Angry? Would you take your business elsewhere?

This is the common mistake most prototyping projects make. They believe the customer will stand still, waiting while the IS staff redevelops the "production" version of the system based on the prototype's demonstrated requirements. However, if you can show it to users, they'll want it. You had better be ready to deliver or there will be hell to pay in terms of customer relations and lost credibility.

If you are going to create a prototype, it must be a deliverable one that can then be evolved to meet customers' desires and expectations.

One way to look at rapid evolutionary development is to use a logical view of what happens. First, you create the initial working system. Then, until the system is replaced by a younger one, you continue to expand and grow the system from infancy to maturity. Amazing things can happen using this approach.

At Du Pont Co., the use of an iterative development approach, coupled with heavy user involvement and computer-aided software engineering (CASE) tools, has produced more than 400 new programs with no failures and helped reduce maintenance by 70% to 90%.

Trans World Airlines completely rewrote its IMS-based frequent-flier program in a relational database system. The project took 15 months using a data-driven methodology and integrated CASE tools. Users can now add new functions to the application in four to eight hours. In isolated cases, users reported fivefold productivity gains in new product development.

Taking it slow

Despite the success stories, few IS organizations have undertaken the job of transforming the development and maintenance process to an evolutionary one.

History has shown us that large, cumbersome methodologies will fit only a certain size of project, not all projects. A flexible, evolutionary prototyping methodology lays out the fundamentals of software creation and evolution. It can significantly improve productivity and quality. The methodology works like the expansion unit in a PC: The application creation or evolution team can choose the specific methods (expansion cards) to customize the prototyping methodology to match its application.

Using a flexible, evolutionary methodology, we can then integrate software tools with the methods to create an integrated technology platform to automate the software processes. The technology platform will then support all of the activities of software creation and evolution.

The creation process for rapid evolutionary development is simple:

PLAN the project.
Choose the project that requires fast delivery and is not well-understood. This means there must be rapid growth and evolution of the requirements and the whole product during its development. Iteration and evolution will occur whether planned or not. Planned evolution before the product escapes is better than unplanned evolution after a failure in the field.

Gather and define customer and market requirements. It is useful to begin framing the user's expectations of the creation process. Focus on his needs, not his wants or wishes.

There will be many rounds of mutual negotiation, participation and feedback to create an embryonic system that can be used effectively. This repeated assessment of the customer's and market's requirements will ensure rapid convergence on the best possible solution.

Quick & dirty, *page 112*

Benefit rundown

Rapid evolutionary development has some dramatic benefits:

Rapid evolutionary development enables IS departments to create software quickly and effectively at low cost. In fact, the cost of a microcomputer-based system can be as low as $10,000 to $50,000 for a three- to 12-month effort.

The process chops cycle time from concept to delivered product by a factor of four or more. Because you create only 20% of the product that provides 80% of the value, the system comes into the world with incredible capabilities.

Raising a bouncing baby system

Rapid evolutionary development can be described in terms of human courtship and family development:



Courtship

First you have to choose the right mate. Initially, there's a lot of courting as the software developer and user romance each other. Eventually, they decide to "get into bed" together. A prenuptial agreement is often a great idea.

Pregnancy



Prototyping is much like pregnancy — creation of an embryonic system that can survive in the real world. First, the user conceives an idea. Together, the software developers and the customer work together to develop the initial version of the system. This pregnancy is accompanied by tremendous enthusiasm and growth.

Notice that expectant fathers never ask, "How long will this take? Couldn't you deliver the baby in four months instead of nine?" Everyone knows it takes nine months, no matter how many people you put on the task. It's best to let the prototyping process take its natural course and deliver the baby when it's ready.

During this period, parents must prepare a loving environment to receive the new child. Everyone has to be trained in care, feeding and so on.



Birth

Finally, the system is formed sufficiently to live in the world. The initial version (a small one) is "delivered" and installed for use. Like most newborns, it will wake IS parents up in the middle of the night with all kinds of problems. Brand new systems need a lot of initial care. Parents don't ask "When is this child going to be able to take care of itself?" because they know it will take time to reach maturity.



Childhood

At this point, the system is fairly well-mannered. It continues to grow organically and naturally — no new hands, feet or organs are added. It learns at a reasonable rate. Customers and IS both enjoy this period of working together to help the system develop.

Customer terrorists

Quality improvement has one main focus: customer satisfaction. Keep in mind that a dissatisfied user is a terrorist. A dissatisfied user will tell an average of 16 other people about his problems. A satisfied user will tell eight. Rapid evolutionary development can help improve software quality and productivity and, hence, customer satisfaction.



Adolescence

The system will continue to grow, gain weight and learn. At this stage, changes in markets or organizations can cause problems. The software may develop some wild hormonal urges that will test the mettle of the developer and customer. The software may need braces for its teeth or strong guidance to set its path.

At this point, the system may get the urge to spin off some children of its own. Just say "No!"



Adulthood

Maturity develops. We can no more create a mature system that we can create a mature person. As the system matures, however, it will provide increasingly more benefit to the customer and require less support and attention from the developer.

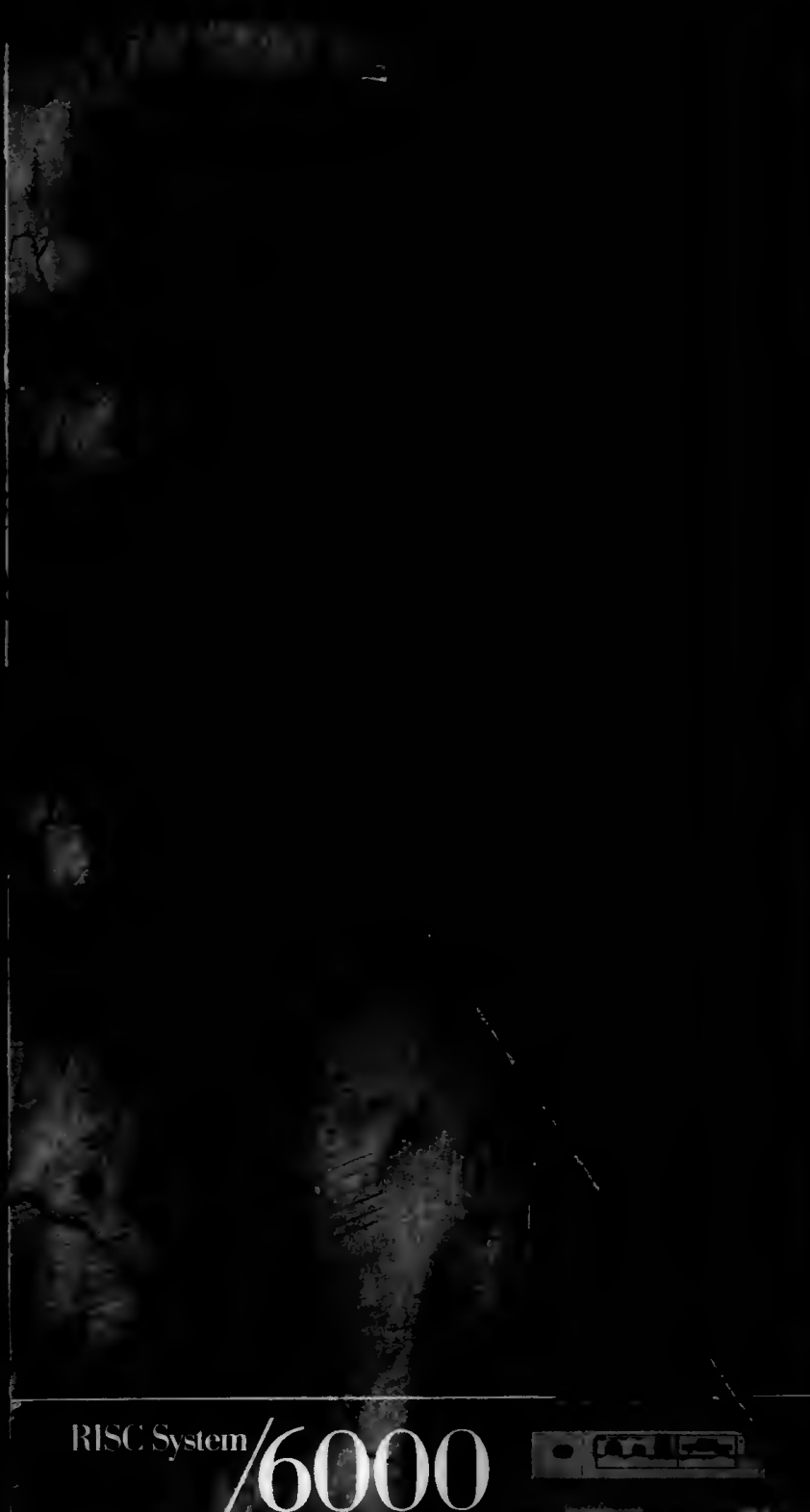
At some point in their lives, systems may put on some extra weight and need to reduce some flab — both data and processes. Some systems will opt for plastic surgery and various creams and balms to postpone the aging process. This is OK. No one likes ugly, old systems; we appreciate elegant, mature ones. Through good nutrition and balanced effort, the system can stay younger longer.



Old age

Through proper exercise and diet, software can thrive. It can live a long and healthy life and retire, or it can develop all kinds of health problems and require expensive medical care.

All of this depends on how it was treated during its lifetime. Rapid evolutionary development demands that we examine the overall ecology of any change in the system during its life.•



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Continued from page 110

Begin the analysis of the customer's process. As we gather requirements, we need to begin sorting and chunking the customer's requests into needs, wants and wishes. We need to begin anticipating the evolutionary path of the system as it grows. Process management can help IS guide the technical evolution. Will the system be a plant, rooted in one place, or a more mobile system that can move quickly to attack various markets?

CREATE the prototype.
The prototype plays a key role in the success of the software mission. A demonstrable behavioral model provides so much feedback that you can't help but come up with better products.

Static, two-dimensional representations (design documents) of dynamic software systems that are supposed to move and grow and process information cannot help but be incomplete.

CHECK closeness of fit.
Evaluate the prototype using customer feedback. Given a working, demonstrable system, customers can tell you how far or how close you are to their goal. They can give you better feedback about how to make their system better.

ACT to improve.
You always want to improve the prototype. Using customer and prototype feedback, identify the next steps required to ecologically grow the system to the next step in its evolution.

Beneficial gains
Compared with standard development processes, rapid evolutionary development offers several benefits:

- **Effective communication.** Rapid evolutionary development opens up communication because the embryonic systems demonstrate, rather than represent, what is happening.

  Designs are maps of the world. Prototypes are the territory. Prototyping simplifies demonstration, evaluation and modification of the growing system.
- **Reduced risk.** Rapid evolutionary development reduces risk by eliminating uncertainty. The initial system is often created with fewer people in less time. Cycle time to proof of concept is reduced.
- **Desired functionality delivered.** It increases the ability to deliver desired functionality. Customers continuously refine their needs by using the prototype and offering feedback. This reduces the need for maintenance and enhancement when the system gets in customers' hands.

  Customers usually don't know exactly what they want. They learn along with IS as the system develops. Changes in direction are accomplished easily.
- **Built-in learning process.** Because we know that we are operating on incomplete knowledge whenever we start a development process, rapid evolutionary development encourages us to learn as we go, backtracking and changing things until we get them right. It encourages change rather than stifling it. Frozen requirements cannot reflect the dynamics of the organization or market.
- **Innovation.** Rapid evolutionary development encourages discovery and serendipity in the development of desired functionality. If we learn as we go, there is a much greater chance of discovering opportunities along the way that will shape the course of the system and possibly the course of the company.
- **Reduced cycle time.** The process chops cycle time from concept to delivered product by a factor of four or more. Because we are creating only 20% of the product that provides 80% of the value, the infant system comes into the world with incredible capabilities.

  Rapid evolutionary development enables IS to create software quickly and effectively at low cost. In fact, the cost of a microcomputer-based system can be as low as $10,000 to $50,000 for a three- to 12-month effort. Rapid evolutionary development also permits early availability of a working system to begin exploiting the opportunities in the market.
- **Fewer defects.** It reduces defects through continuous testing and evaluation of system components during the initial prototyping and ongoing evolutionary phases. User manuals and training can be developed using the working prototype to ensure accuracy.
- **Flexible growth.** It encourages the creation of evolutionary systems that are easy to grow and evolve because every step of development is an evolutionary step.
- **User commitment.** It continuously involves users in the solution, which encourages ownership and commitment. It also encourages product acceptance. The marriage of IS and users creates a healthy environment for the system's development.

  User needs are always changing, and software, by nature, is always late and falls short of the user's expectations. Evolutionary prototyping, however, minimizes delay and shortfall when compared with conventional, incremental or throwaway prototype development approaches.

The right formula

The critical success factors for succeeding at rapid evolutionary development are:

- **A committed and informed executive sponsor.**
- **An operating sponsor — a champion.**
- **Appropriate IS staff.**
- **Appropriate technology.**
- **Management of data.**
- **A clear link to business objectives.**
- **Management of organizational resistance.**
- **Management of system evolution and spread.**

For example, Hitachi Data Systems Corp. management found it needed a disciplined and standardized approach to development, an effective way to visualize and control the production process, a consistent way to specify requirements, an integrated set of tools, portable computer languages and reuse of components. Rapid evolutionary development encompasses all of these things.

Unlike a car that rolls off an assembly line or a house ready for occupancy, software systems continue to expand and change over time. Once you've gone through rapid evolutionary development and delivered the system into everyday use, its freewheeling accelerated growth slows. The software grows in a more carefully orchestrated and focused process of software evolution (maintenance).

Software evolution structures the customer's change requests and problem reports into scheduled system releases that maximize productivity through grouping changes by interim product — data, program or documentation — and through the ability to schedule and rigorously test each of these as it is changed.

Growing and growing
The evolutionary maintenance methodology establishes a way to grow a system from infancy into adulthood through incremental, evolutionary enhancement steps and genetic or surgical repairs.

Where maintenance once consumed 80% of the IS budget, evolution will consume less than 50%. The remainder of the budget can be used to deliver new systems and functions via the rapid evolutionary development process.

The software creation process can be used throughout the system's life to create major enhancement and extensions of the system's knowledge and abilities. Using rapid evolutionary development and software evolution, prototypers can continuously improve and enhance the system as the environment changes around it. •

Paperwork prevention

Large, cumbersome software development methodologies generate masses of paper and require an extensive paper-support system that impedes productivity.

What upsets software professionals more than anything is to have some new laborious paperwork process foisted on them in the guise of a great new methodology. Rapid evolutionary development, however, tends to minimize paperwork because the system grows organically.

Rigorously documenting a changing structure and functionality is unnecessary. There are so few people involved in the project that communication of changes can be handled informally. Only the bare essentials of documentation are required.

The prototyping team should create its own standards for depth of documentation and then follow them.

Arthur has more than 20 years' experience in the creation and evolution of software. He is the author of *Programmer Productivity, Software Evolution: The Software Maintenance Challenge* and *Rapid Evolutionary Development*.

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Computer Careers

Key to minority success: Follow a strategy



By Ben Berry

You'd think that with the overwhelming proliferation of systems across industries and the need for professionals to support them that doors would open to minorities. Yet few of us have made it through the ranks of information systems.

I found one of those open doors. And behind it, I found other open doors. I didn't make it to the top because companies had requirements to meet — I made it with a strategy and the perseverance to make it work.

Few minorities

I nearly always seemed to find myself alone as the only African-American IS professional on the job while progressing up the ranks.

But I've established a network with IS professionals by joining enterprisewide strategic teams whose goals are to set IS standards and the baseline for policy decision. I also take advantage of opportunities to give professional presentations. I see these as opportunities to share my agenda and be recognized by cross-departmental or intercompany organizations.

If minorities have not entered IS in great numbers, then perhaps the reasons are twofold. First, there is not enough mentoring and role modeling. If few minority mentors and role models exist in this business, then it's no wonder only a few of us ever make it to the ranks of programmers, systems analysts and managers.

It is also important to develop political savvy. It helps to know and understand your boss' boss. Establishing either formal or informal one-on-one meetings with these individuals can help you understand how the office really runs and gain a better appreciation of the short- and long-term organizational goals. This investment of time will build your political capital, which you can cash in at appropriate points during your career. For instance, by knowing the players in the game, you'll hear about job openings before they're posted.

Even though many people are not comfortable with establishing political allies and forging links with senior-level management, you can overcome this by recognizing politics as just one more component in the cost of production. It's not just the best technology or process that wins at the end of the day. If you can't sell it or position it because of a political deficit, then you may become a loser among winners.

In addition to politics, several other strategies have helped boost my career.

I learned very early that IS has two career paths. Both paths start from a programming root, but as we move on, the path may branch: one toward an ever-increasing technical window, the other opening into management.

With each move, my strategy was to be flexible and mobile in terms of the type and size of company and its location. I was able to beat my competition in scope and depth of experience and secure the position, increasing my responsibilities and compensation package.

Secrets to success

- Decide between technical or management path early.
- Find a minority mentor.
- Develop political savvy.
- Be flexible about type and size of company for which you are willing to work.
- Continue education.
- Prepare and publish IS documents.
- Give speeches and presentations.

In my experience, I've found that for minorities, advantages and disadvantages exist in both large and small companies. In large companies, equal opportunity programs seem to provide more entry-level positions for minorities who are new to the field, so it might be a better place to start your career. However, large companies could also be to your disadvantage because a larger competition base exists.

A drawback to smaller firms is that they tend to maintain their company culture. This means that if minorities are not already on staff, firms might subconsciously avoid hiring minorities. If you do find a job in a small company, however, you'll find that they promote staff faster and provide a greater variety of work assignments. This is driven by the need for a few good people to do a lot more work. The downside is that you are typically overworked and, on average, not paid as much as colleagues in larger firms.

Role model

In either case, it's helpful to find a role model once you are at a company. If there aren't many minority role models in your organization, you might want to try some other tactics. My successes were gained through public job announcements in computing magazines, newspapers and an employer-paid job service.

Because minorities have traditionally been underrepresented in both educational-level and business-area analysis, it has become a catch-22 for why fewer minorities are promoted to higher levels of IS.

One way to overcome this lag might be to continue your education. Going back to school and taking computer courses (my undergraduate degree was in the sciences) made me more competitive in applying for IS positions. I was also able to widen my experience base by preparing and publishing IS documents and giving presentations. Additionally, I increased my IS value by joining critical success-factor teams to broaden my exposure to technology issues in order to supplement my current work-load assignments.

IS opportunities exist for minorities. But like any IS professionals in this economy, we need to think smart and follow a strategy to stay on top of career advancement opportunities.

Berry has worked in IS for 18 years. He is currently employed at Hughes Aircraft Co. in Los Angeles as a computer services manager.

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Data Processing Systems Analysts These positions require a Bachelor's degree or equivalent with 10+ years practical maintenance experience to include five years with an automated logistics system. Your background should demonstrate strong analytical and problem-solving abilities, excellent organizational and communications skills, and familiarity with USAF procedures related to maintenance of automated logistics. USAF flight line or industrial aerospace manufacturing experience is strongly preferred.

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Career advice for the '90s

For security, target future technology

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Chick Bisberg, president of Two-Party Systems, Inc., an information technology recruiting firm in Livingston, N.J.

Q: I'm a mainframe Cobol/Assembler programmer with four years of experience. My first year I worked with CICS, and the balance of my experience is with IBM's Check Processing Control System. I'm afraid that I'm becoming too specialized. How can I ensure my future competitiveness?
A: Look into what other application areas at your bank (preferably supporting profitable product or service groups) presently use the Cobol, Basic Assembler Language or CICS strengths you have already developed. Find out which of those applications might be ripe for migration to newer systems technologies.

Keep up with job postings from those areas and try to move internally. If that's not feasible, look to other companies that would hire you for the skills you possess now and might train you for new things down the road.

Q: I'm a systems analyst and have been in the computer business for 12 years. I have experience with the System/34, System/36, Application System/400, RPG and Cobol. I would like to get a job in Saudi Arabia. How should I go about finding one?
A: Scour the media for ads listing opportunities in Saudi Arabia, contact the Saudi Embassy and inquire about potential opportunities with U.S. or Saudi companies that might relocate there. Contact recruiting firms specializing in international and overseas positions.

Identify U.S. firms that would likely do business in Saudi Arabia (such as firms that supply oil field equipment or expertise) and be sure to get in touch with their human resources departments.

Q: I'm an MIS manager at a small manufacturing company. Our central computer system is old technology. Fortunately, I have been able to introduce PC hardware and software so my technical skills are very current. I'd like to get into business systems analysis as my own business or with a consulting organization. Any tips on how?
A: Make certain that your resume fully outlines the front end of your skill set: the user interface, analytical, design, spec writing, training and acceptance testing functions. These, teamed with your project/people management abilities, form the real day-to-day job content of most business systems analyst roles.

Your hands-on technical skills and knowledge should also be discussed in the context of your overall functional objective: to provide solutions to business problems.

Q: I'm a network administrator with a bachelor's degree in computer science and a master's degree in information systems. What is the most effective way to outline this information on my resume?
A: Include both of your degrees, as well as a full listing of hardware and software experience. List this information at the beginning of your resume.

This produces a very scannable document and will provide a base for more detailed discussion of your network skills, knowledge and accomplishments in the experience section of the resume.

Are burned out? Grappling with work/family issues? Worried about skills stagnation? We want to hear from you about these and other issues that affect your career. Call your questions in using the Fast Track line at (508) 820-8522 or send them by fax to Kelly E. Sewell at (508) 875-8931. If we use your question, we'll send you a gift.

How to prepare for a high-level position

■ It's a matter of taking on more responsibility than what's required before the post becomes open. Most people who work for me are qualified for the next position before it opens.

John Robinson, director of data processing County of Walla Walla, Walla Walla, Wash.

TIPS from the TIMES

■ A lot of people don't concern themselves with preparing for a particular position until it becomes open, but that's typically too late. Be proactive. If a position exists in the company that you'd like, even if it's currently filled, that's the ideal time to get to know the skills and understand the job. By being proactive, rather than waiting, your manager will see that you've demonstrated your ability to be a good candidate.

Michael W. Onufer, director of data processing Radio & Records, Inc., Los Angeles, Calif.

■ Let your supervisor know periodically or at review time that you're interested in advancing within the department or company. If it's a job that has a broader scope, you should be asking for assignments that will prepare you for those additional responsibilities.

Alan K. Mis, director of information systems American Steamship Co., Buffalo, N.Y.

■ Call the manager of the department that you're interested in and make him aware of your interest. If you want to follow a specialized career path, you might want to take some courses. You could ask a manager what you will need to qualify for a position down the road.

Robert M. Goldberg, vice president, IS group Old Stone Bank, Warwick, R.I.

Compiled by Kelly Sewell, assistant editor, features.

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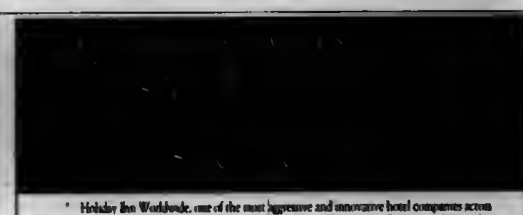
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The District offers competitive salaries, excellent benefits and a drug-free, smoke-free workplace. For consideration, send your resume to: South Florida Water Management District, Re: CW/1214/SSP, 3301 Gun Club Road, West Palm Beach, FL 33416. EOE M/F/D/V

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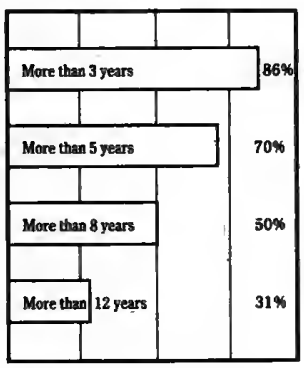
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Avoid mail-order pitfalls: Read all the fine print

By Alice Bredio

Many computer mail-order ads promise everything short of doing your work for you. But what do all of the words in these ads mean? And how many of these promises are genuine? Phrases such as "free service," "complete money-back guarantee" and "cash discount" sound simple, but they aren't always as straightforward as they appear. Following are some of the trickier terms that might lead you astray:

■ **FREIGHT ON BOARD (FOB), FREIGHT ON DELIVERY (FOD):** If the ad says FOB, shipping costs are paid by the seller. If it says FOD, the buyer pays. This cost varies depending on the system price and how it is delivered.

■ **RESTOCKING FEE:** A common buyer complaint is about the fee tacked on by the vendor when equipment is returned. "Restocking fees are legal and can run as high as 30% of the system price," says Stephanie Brown, director of consumer affairs and special projects at the Electronic Industries Association in Washington, D.C.

These fees can apply even when an ad touts a money-back guarantee — which can translate to money-back minus a restocking fee.



■ **RETURN AUTHORIZATION:** It is pretty common for a buyer to need return authorization or approval from the vendor to return the system. Buyers have to explain the reason for the return and get an authorization number that tells the vendor what to do with the machine when it arrives.

Before the sale, seasoned buyers suggest checking into who pays for shipping costs and what the replacement policies are in case a machine is delivered dead on arrival.

■ **CASH DISCOUNT:** This is a typical way for a company to charge fees for credit-card use. While most major credit-card companies don't allow this, some vendors still offer it. Beware, an advertisement for a 3% cash discount can really mean that credit-card users will face a 3% surcharge. Incentives to pay cash may also indicate that the company is in financial trouble.

■ **ON-SITE SERVICE:** In some cases, ads may boast of on-site service, but the catch is it is not offered to everyone, or at every location. It may also be for a very limited period of time. Ads with "on-site service" in bold letters often have fine print at the bottom stating that a service contract must be purchased, Brown says. Her advice: Before buying, call and check with the vendor to see what the service encompasses.

■ **FULL MANUFACTURER WARRANTY:** This term can indicate that the company or dealer that sells the system does not offer support. In this case, you will have to contact the manufacturer and make sure support is easily obtainable.

■ **WE RESERVE THE RIGHT TO SUBSTITUTE AN EQUIVALENT ITEM:** When a component is not in stock, vendors will replace it with another brand. "This substitution clause is standard," says Maxwell Sroge, owner of Maxwell Sroge Co., a mail-order catalog consultancy in Chicago.

However, the word to watch is "equivalent," which can be subject to broad interpretation. In some instances, a better part will be substituted. For this to work, the ad should read "equivalent item or better."

Also, be sure the return policy allows you to return the system if you are unhappy with the substitution, Sroge says.

Bredin is a free-lance writer based in New York.

Sins of omission

Free delivery — Not. Free delivery is only occasionally offered for mail-order items. Unfortunately, buyers may learn about shipping and handling charges after it's too late, says Maxwell Sroge, a mail-order catalog consultant in Chicago. Savvy buyers suggest making a few calls to the vendor before putting in the purchase order.

Freebies. Most vendors don't usually advertise that they have promotional items — usually software — to give away. The best bet is to ask if anything additional comes with the system or if anything can be tossed in for free.

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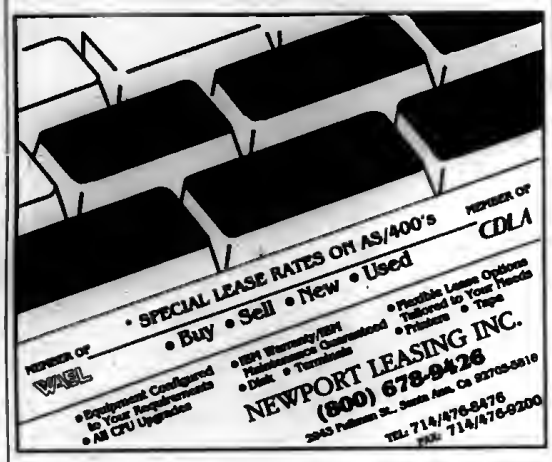
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Detailed specifications for each RFP with a charge may be obtained by submitting a written request accompanied by the appropriate payment. No phone requests will be accepted. NOTE: Valid forms of payment are corporate checks on a Mississippi bank, certified check or POSTAL money order made out to Central Data Processing Authority. No cash or out-of-state-checks. For RFPs with no charge call Kelli Brown @ 601-359-2604. If you would like to pick up RFPs at CDPA, you may do so between the hours of 1:00-3:00 p.m. only. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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Requests for RFI package should be directed to RFI Coordinator NYC Department of Transportation, 51 Chambers Street, Room 420, New York, NY 10007 Fax no. (212) 788-8159 For further information contact Dr. Hedvah Shuchman (212) 788-8168

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REQUEST FOR PROPOSAL
No. 92-05481-P-JB

The Federal Deposit Insurance Corporation ("FDIC") issued a Request for Proposal for a Legal Division Information Management System on December 2, 1992. The FDIC and its Legal Division are soliciting for the acquisition, customization, integration and installation of an existing and commercially available software product, package or packages and/or service or services to create the system. The FDIC Legal Division has locations in Washington, D.C., 17 regional and 35 field offices with a projected legal staff of 2569 employees.

Those who wish to receive a copy of the Request for Proposal, submit an offer, or receive amendments and other information must contact Jim Brennan, Contract Specialist in FDIC's Procurement and Contracts Section, at (202) 898-8675.

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Questions should be directed to: **Mr. Humberto Cruz, Port Authority of New York and New Jersey, One World Trade Center, 82 South, New York, NY 10048** or by FAX, to his attention, at (212) 435-3954.

Vendors who were previously qualified based on response to our advertisement for these services, on July 22, 1992, need not re-qualify.

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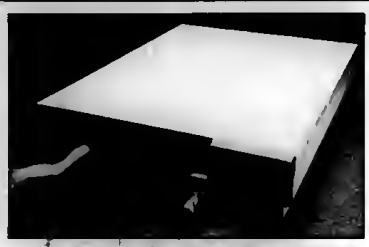
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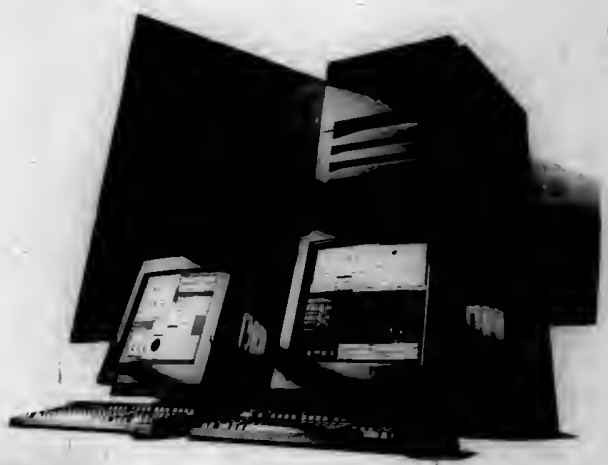
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Dell Computer Corp.	4.00	IBM	-4.88
Sequent Computer Sys.	2.88	Borland Int'l Inc.	-4.00
Wellfleet Communications	2.50	Parametric Technology	-4.00
Computer Sciences	2.50	Autodesk Inc.	-3.75
Raytheon A&E Electronics	2.50	BMC Software Inc.	-3.50
Xylan	2.25	Rainbow Technologies Inc.	-3.50
Stratus Computer Inc	2.25	Novell Inc.	-3.38

Software firms ride trends

Recent action in the stock exchange has reflected market trends affecting big desktop software vendors. Software sales favor Microsoft Corp. (MSFT) and Lotus Development Corp. (LOTS) while, for the moment, Borland International, Inc. (BORL) seems to be swimming against the tide.

For example, sales of Windows-based word processors and presentation graphics packages are booming, according to figures released by the Software Publishers Association (SPA) in Washington, D.C. The SPA pegged third-quarter Windows word processor revenue at $37.6 million, up 215% from the same period in 1991. Windows presentation graphics sales, a smaller category with roughly $8 million in third-quarter sales, jumped a healthy 368%.

Microsoft, which closed Thursday at 89, is well-positioned in both of these high-growth areas, with Word for Windows gaining market share in recent months and a new version of PowerPoint selling well.

Lotus' Ami Pro owns a relatively small share of the word processing market, but Version 3.0 is rapidly gaining momentum, according to a report by analyst Terence Quinn at Kidder, Peabody & Co. Freelance Graphics for Windows is also gaining ground against presentation graphics leader Harvard Graphics. Lotus stood at 20½ on Thursday.

Borland has no products to contend with Microsoft and Lotus in the graphics and word processing markets, and revenue growth in Borland's areas of strength is less robust. The SPA figures show a 3.4% decline in overall sales in the DOS database category from the third quarter of 1991, where Borland's dBase and Paradox lines are struggling to maintain share against Microsoft's FoxPro. Meanwhile, Microsoft has released Access, while Borland struggles to bring Windows database products to market. Borland stock has fallen dramatically in recent months, and it closed Thursday at a 52-week low of 20¼.

— Derek Slater

Desktop dilemma

Wall Street analysts disagree on what's in the cards for the big desktop software vendors

Vendor	Donaldson, Lufkin & Jenrette	Kidder, Peabody & Co.	Needham & Co.
Borland International, Inc.	Neutral	Underperform	NR
Lotus Development Corp.	Neutral	Buy	Hold
Microsoft Corp.	Attractive	Hold	Buy

NR: Not rated

Exch	52 Week High	52 Week Low		Dec.31 Close	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						
OTC	24.00	9.63	3 COM Corp	23.63	1.00	4.1
NYS	70.63	56.75	American Info Techs Corp	69.00	1.38	2.0
NYS	48.75	36.63	AT&T	48.75	1.38	2.9
OTC	4.25	0.75	Artel Communication Corp	1.50	0.19	14.2
OTC	22.00	10.25	Banyan Systems Inc	19.75	1.00	-4.8
NYS	49.75	40.25	Bell Atlantic Corp	49.63	1.88	3.9
NYS	55.50	43.38	BellSouth Corp	50.00	1.00	2.0
NYS	6.75	3.63	Bolt, Beranek & Newman	4.63	-0.25	5.3
NYS	75.38	42.13	Cabletron Systems	72.00	-2.38	-3.2
OTC	31.00	17.75	Cripcom Corp	26.50	0.50	1.9
OTC	76.50	26.50	Cisco Systems Inc	71.00	2.75	3.7
OTC	35.25	5.50	Compression Labs Inc.	13.38	-0.88	-6.1
OTC	3.38	0.88	Data Switch Corp	2.54	0.13	5.1
NYS	21.63	13.75	Digital Comm Assoc.	16.88	0.13	0.7
OTC	15.25	7.50	Digital Systems Int'l Inc	10.50	0.50	-4.5
OTC	20.13	3.63	DSC Communications	19.00	0.75	3.8
OTC	10.88	4.75	Fibronix Int'l Inc.	6.88	-0.38	-5.2
OTC	37.50	10.50	Fulcrum Corp	21.38	0.38	1.8
OTC	3.38	1.50	Gandalf Technologies Inc	1.75	-0.13	-6.7
OTC	2.25	0.69	Gateway Communications	1.38	-0.19	-12.0
NYS	6.00	2.50	General Datacomm Inds. (H)	6.00	0.50	9.1
ASE	5.88	1.00	Go Video	2.88	-0.13	-4.2
NYS	35.75	28.88	GTE Corp	33.88	0.38	1.1
NYS	72.00	50.00	ITT Corp (H)	69.75	-2.00	-2.8
OTC	38.50	26.75	MCI Communications Corp	38.00	-0.38	-3.0
OTC	14.25	7.25	Microcom Inc	5.88	-0.25	4.1
NYS	18.25	9.50	Network Equipment Tech	9.50	-0.13	1.3
OTC	25.50	8.00	Network General	17.75	0.25	1.4
OTC	30.00	8.50	Network Systems Corp	12.13	-1.88	-13.4
OTC	33.75	5.88	Newbridge Networks Corp (H)	33.75	2.25	7.1
NYS	69.25	30.50	Northern Telecom Ltd	41.38	-0.88	2.1
OTC	33.50	22.50	Novell Inc	28.00	3.38	-10.8
NYS	88.38	69.13	Nynex Corp	84.75	1.00	1.2
OTC	37.50	14.50	Octel Communications Corp	22.50	0.00	0.0
OTC	53.00	10.25	Picturetel Corp	22.75	-2.25	-9.0
OTC	18.75	7.00	Proteon Inc.	9.63	-1.00	-9.4
NYS	38.25	16.13	Scientific Atlanta Inc (H)	36.88	-1.13	-3.0
NYS	71.00	56.63	Southwestern Bell Corp.	71.00	0.75	1.1
NYS	26.75	20.75	Sprint Corp	25.75	0.88	2.8
OTC	25.88	5.25	Standard Microsystems Corp (H)	24.50	-0.13	-0.5
OTC	20.25	15.25	Stronotics Communications (H)	69.50	0.75	-1.1
OTC	24.25	12.25	US Robotics	20.25	0.25	1.3
NYS	40.00	32.88	U S West Inc	38.00	-0.13	-0.3
OTC	72.75	24.00	Wellfleet Communications	72.75	2.50	3.6
OTC	51.00	28.75	Legent Corp. (H)	48.00	-2.75	-5.4
OTC	38.75	14.75	Lotus Development	20.75	-1.75	7.8
NYS	7.38	1.88	Mecca Software	5.63	1.63	40.6
OTC	22.25	5.25	Mentor Graphics	8.50	-0.13	-1.4
OTC	42.13	27.25	Micro Focus (H)	41.00	-1.13	-2.7
OTC	20.50	6.50	Microgramx Inc	8.75	-0.56	-5.4
OTC	95.00	65.50	Microsoft Corp	86.25	5.75	6.3
OTC	24.75	12.00	Oracle Corp.	21.88	-1.00	-4.6
OTC	56.25	23.38	Parametric Technology	48.00	-4.00	-7.7
OTC	11.00	3.50	Phoenix Technologies	6.63	-0.13	-1.9
OTC	25.25	11.25	Platinum Technology	18.75	1.38	-7.0
OTC	60.00	29.00	Progress Software Corp	59.75	1.50	2.6
OTC	26.63	4.00	Quarterdeck Office Sys.	6.75	0.00	0.0
OTC	32.75	11.75	Rainbow Technologies Inc	21.00	-3.50	-14.3
OTC	22.75	6.00	Rasterops	7.50	-1.00	11.8
OTC	17.25	3.63	Ross Systems	8.25	1.63	-16.5
OTC	18.88	8.50	Sapiens USA Inc.	17.38	-0.38	-2.1
OTC	26.25	8.73	Software Publishing Corp.	8.88	-0.63	-6.6
OTC	8.00	2.00	Software Toolworks Inc.	5.50	-0.25	4.3
OTC	7.25	0.75	Spinnaker Software	1.75	0.38	27.3
OTC	16.00	3.25	State of the Art	7.75	0.50	6.9
NYS	25.25	13.75	Sterling Software Inc.	20.63	-0.88	-4.1
OTC	50.00	8.00	Struct Dynamics Research	11.88	-0.50	-4.0
OTC	45.25	19.00	Sybase Inc.	43.63	0.88	2.0
OTC	51.00	5.88	Symantec Corp.	14.13	0.25	1.8
NYS	15.50	5.25	Systems Centre Inc.	7.00	-0.13	-1.8
OTC	38.00	16.88	System Software Assoc. (H)	34.38	-0.88	-2.5
OTC	13.25	2.50	Tenfric Corp.	3.50	-0.25	-6.7
OTC	27.75	14.00	Walker Interactive Systems	22.13	0.38	1.7
OTC	5.38	1.38	Wordstar	2.44	0.00	0.0
SEMICONDUCTORS						
NYS	21.50	7.38	Advanced Micro Devices	16.88	0.13	0.7
NYS	16.88	7.50	Analog Devices Inc. (H)	14.88	0.25	1.7
OTC	16.25	6.75	Atmel Corp	15.50	-0.38	-2.4
OTC	16.13	3.25	Chips and Technologies	4.88	0.00	0.0
NYS	18.88	7.38	Cypress Semiconductor Corp	10.38	-0.50	4.6
NYS	14.50	6.75	Dallas Semiconductor	13.50	-0.75	5.3
OTC	79.00	61.25	Intel Corp (H)	79.00	0.38	0.5
NYS	10.75	4.88	LSI Logic Corp (H)	10.75	0.38	3.8
NYS	22.88	12.13	Micron Technology	12.63	-3.75	-9.0
NYS	104.38	56.00	Motorola Inc	102.88	1.00	1.0
NYS	14.13	5.38	National Semiconductor	10.88	-2.13	-16.3
OTC	27.00	8.25	Sierra Semiconductor	13.00	-2.00	13.3
NYS	52.25	26.00	Texas Instruments	47.25	-2.00	-4.1
OTC	10.88	6.00	VLSI Technology	7.63	0.50	7.0
OTC	7.00	2.13	Weitek	4.88	-0.38	-7.1
ASE	8.00	2.00	Western Digital Corp	7.63	-0.13	-1.6
OTC	51.00	14.50	Xilinx	23.25	2.25	10.7
OTC	33.88	15.88	Zilog Inc.	32.75	1.00	3.1
PC'S AND WORKSTATIONS						
OTC	10.25	3.50	Advanced Logic Research	4.38	0.13	2.8
OTC	70.00	61.50	Apple Computer Inc	58.25	0.75	1.3
OTC	24.50	11.25	AST Research Inc.	19.50	-1.25	-6.0
NYS	19.25	6.75	Commodore Int'l	7.75	1.00	-11.4
NYS	43.25	22.25	Compaq Computer Corp	43.25	0.75	1.8
OTC	40.75	15.00	Dell Computer Corp	40.75	4.00	10.9
OTC	7.75	0.50	Everex Systems Inc	0.88	0.00	0.0
NYS	35.38	21.25	Harris Corp	33.00	1.00	-2.9
NYS	85.00	67.63	Hewlett Packard Co	65.38	0.75	1.2
NYS	29.75	14.13	Silicon Graphics	26.25	-1.25	-4.5
OTC	36.13	20.75	Sun Microsystems Inc	32.63	-1.38	-4.0
NYS	31.25	22.25	Tandy Corp	29.75	1.13	-3.6
NYS	11.13	5.00	Zenith Electronics	6.25	-0.38	-5.7
OTC	25.50	2.75	Zeos International Ltd	3.50	-0.50	-12.5
LARGE SYSTEMS						
ASE	20.63	6.63	Amdahl Corp.	7.38	0.00	0.0
NYS	16.38	6.75	Convex Computer	2.63	0.00	0.0
OTC	14.25	1.88	Cray Computer	4.63	-0.13	-2.6
NYS	49.50	19.00	Cray Research Inc.	23.00	-0.88	-3.7
NYS	18.13	7.13	Data General Corp	11.38	-0.75	-6.2
NYS	65.50	31.50	Digital Equipment Corp.	33.25	0.13	-0.4
NYS	100.38	60.88	IBM	62.13	-4.88	-7.3
OTC	13.25	5.50	Kendall Square Research	13.00	0.00	0.0
NYS	119.25	83.00	Matsushita Electronics	94.25	2.50	2.7
OTC	17.50	6.00	Pyramid Technology	8.50	-0.75	-8.1
OTC	18.00	10.38	Sequent Computer Sys	18.00	2.88	19.0
OTC	18.38	2.75	Sequoia Systems Inc.	3.50	0.00	0.0
NYS	34.25	29.50	Stratus Computer Inc	36.75	2.25	6.5
NYS	15.13	9.50	Tandem Computers Inc	15.00	0.38	2.6
NYS	11.75	4.00	Unisys Corp.	9.75	0.50	-4.9
ASE	7.50	0.08	Wang Labs Inc. (g)	0.44	0.09	0.0
SOFTWARE						
OTC	48.50	25.75	Adobe Systems Inc	31.38	-2.13	6.3
OTC	44.25	10.26	Alpus Corp	33.75	-1.88	-5.8
OTC	19.75	7.00	American Software Inc.	9.13	-0.13	-1.6
OTC	22.38	9.75	Ase Computer Systems (H)	22.38	1.63	7.8
OTC	56.50	23.25	Autodesk Inc.	46.25	3.75	-7.5
OTC	37.75	3.75	Bachman Info. Systems	6.00	0.50	9.1
OTC	63.00	32.00	BGS Systems Inc	39.00	2.00	-4.9
OTC	79.00	37.25	BMC Software Inc	64.75	3.50	-6.1
OTC	27.00	13.00	Boole & Babbage	22.00	0.25	-1.1
OTC	86.75	20.75	Borland Int'l Inc.	20.75	-4.00	16.2
OTC	10.50	3.63	CE Software	4.19	0.06	1.5
ASE	29.75	9.38	Cheyenne Software Inc.	28.88	1.63	6.0
OTC	13.13	5.63	Cognos Inc	7.50	0.00	0.0
NYS	19.50	8.63	Computer Associates	18.13	-0.88	-4.6
NYS	12.38	4.63	Computervision Corp	4.63	-0.25	-5.1
OTC	20.00	6.75	Compuware Inc.	13.75	-0.25	1.8
OTC	47.88	6.00	Easel Corp	12.25	-0.50	3.9
OTC	25.00	11.50	Group 1 Software	16.00	0.00	0.0
OTC	6.63	3.50	Hogan Systems Inc.	5.63	0.25	4.7
OTC	36.25	18.50	Information Resources	32.00	-1.50	-4.5
OTC	33.50	5.88	Informix Corp	31.75	-0.13	-0.6
OTC	22.38	11.00	Intergraph Corp	13.00	-0.25	1.9
OTC	15.00	7.00	Interleaf Inc	11.13	-0.88	7.3
OTC	20.25	10.25	Intersolv Inc	12.50	-1.00	-7.6
OTC	21.38	9.50	Kronii Edgeware Inc	14.38	0.88	6.5
PERIPHERALS AND SUBSYSTEMS						
OTC	11.25	3.88	Archive Corp.	11.13	0.00	0.0
OTC	29.50	13.75	Banctec Inc (H)	27.63	-0.88	-3.1
OTC	23.50	9.25	Cambex Corp.	16.13	-1.88	-13.7
ASE	15.25	5.66	Comtrotronics Corp.	14.38	-0.75	-5.0
NYS	23.88	13.00	Conner Peripherals	20.13	-0.75	-3.6
OTC	27.88	14.25	Data Race Inc. (H)	25.50	-0.38	-1.6
ASE	19.88	4.75	Databar Corp.	11.25	0.25	2.3
NYS	22.38	6.09	EMC Corp (H)	31.00	-3.25	-5.0
OTC	10.00	4.75	Emulex Corp	9.00	0.38	4.3
OTC	23.00	13.25	Evans & Sutherland	18.25	0.25	1.6
OTC	40.63	12.88	Exabyte	17.38	-2.88	-12.0
OTC	43.00	15.75	Intelligent Info. Systems	43.00	5.50	14.7
OTC	13.25	4.75	Iomega Corp	6.75	0.13	-1.8
OTC	11.75	10.25	IPI Systems Inc.	11.75	1.50	-11.3
OTC	23.25	10.75	Komag Inc.	18.25	0.00	0.0
OTC	19.63	4.38	Maxtor Corp (H)	17.50	1.88	-7.3
OTC	12.63	7.13	Microponics Corp	9.13	-0.75	-7.6
NYS	107.00	85.38	3M Corp	103.38	2.50	2.0
OTC	6.75	3.50	Printronix Inc.	5.00	0.00	0.0
NYS	15.88	6.88	QMS Inc.	12.25	1.63	15.3
OTC	18.00	9.00	Quantum Corp.	16.38	-0.38	-2.2
OTC	12.75	3.75	Radius Inc.	5.75	-0.50	-8.0
NYS	14.25	7.50	Recognition Equipment	13.75	-0.63	-4.3
OTC	13.88	5.63	Rexon Inc.	11.75	-1.00	-7.8
OTC	21.75	7.75	Seagate Technology (H)	20.63	1.00	-4.6
NYS	28.00	20.00	Storage Technology	23.00	0.00	0.0
NYS	22.88	16.50	Tektronix Inc.	18.38	-1.50	-7.5
NYS	82.25	60.88	Xerox Corp.	77.50	-0.63	-0.8
SERVICES						
OTC	23.38	12.16	American Mgmt Systems	22.63	-0.13	-0.5
NYS	4.25	2.38	Anacomp Inc.	4.25	0.13	3.0
OTC	23.00	12.50	Analysts Int'l (H)	23.00	0.25	1.1
NYS	52.88	37.00	Auto Data Processing	52.50	0.00	0.0
OTC	12.25	7.06	Ceridian Corp.	18.75	-1.13	-7.1
NYS	23.22	12.50	Comdisco Inc.	15.00	0.88	2.5
OTC	13.00	6.75	Computer Horizons	9.38	-0.88	-3.8
NYS	84.88	57.00	Computer Sciences	79.25	2.50	3.3
NYS	10.13	7.00	Computer Task Group	8.75	-0.13	-1.4
OTC	40.50	15.00	CompUSA Inc.	33.75	-2.00	-7.3
OTC	19.75	6.00	Corporate Software	12.25	1.25	11.4
OTC	30.75	7.75	Egghead Discount Software	9.88	-1.38	-12.2
NYS	33.75	25.25	General Motors E (EDS) (H)	32.25	-0.75	-2.3
OTC	30.38	6.25	Intelligent Electronics	11.13	-0.80	-4.3
OTC	14.88	6.63	Memtec	10.00	-0.25	2.6
OTC	15.75	5.75	Micrografx Inc.	9.25	0.38	4.2
OTC	40.00	18.34	Paychex	36.75	-1.75	-4.5
NYS	81.38	55.00	Policy Management Sys. (H)	79.38	0.13	0.2
NYS	29.56	15.94	Reynolds and Reynolds	25.00	-0.19	-0.7
OTC	32.00	22.00	SEI Corp.	30.00	1.00	3.4
OTC	24.38	16.88	Shared Medical Systems	21.75	-0.50	-2.2
OTC	36.25	16.00	Sungard Data Systems	30.25	2.00	7.1
NYS	3.63	1.33	Ultimate Corp.	1.88	0.13	7.3

KEY: (H) = New annual high reached in period (L) = New annual low reached in period
NOTE: Reynolds and Reynolds completed a 2 for 1 stock split. Copyright Nordby International, Inc. Louisville, CO
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In Brief

Suits settled

Digital Equipment Corp. said last week that it has settled long-simmering storage-patent suits with **Micro Technology, Inc.** in Anaheim, Calif. As a result, both companies agreed to dismiss all pending litigation and to cross-license some of each other's storage technologies. The license covers DEC's patented disk and controller technology and certain Micro Technology fault-tolerant redundant arrays of inexpensive disks, networking and storage devices.

Borland acquisition

Borland International, Inc. last week acquired dBase-compatible technology from **WordTech Systems, Inc.** in Orinda, Calif. Borland picks up the Argo line of database management software, including code for all versions of WordTech's dBXL database management system and Quicksilver compiler, as well as technology under development.

SMC diversifies

PC local-area network enhancement vendor **Standard Microsystems Corp.** (SMC) in Hauppauge, N.Y., said last week that it has agreed to acquire **Sigma Network Systems, Inc.**, a Reading, Mass.-based provider of internetworking products. SMC said it expects to issue 350,000 shares of common stock to facilitate the transaction. SMC's stock was trading at 25⅞ last Wednesday, which gave the deal a value of roughly $9 million.

Lee Data expands

Lee Data in Minneapolis is acquiring selected assets of Hnrsham, Pa.-based **Decision Data, Inc.'s** Application System/400 and System 3/X-compatible peripherals line. The purchase price is estimated at $19 million, plus other considerations to be paid at closing.

FTC's bark worse than its bite

Investigation of Microsoft likely to result in reprimand, not restructuring

By Christopher Lindquist
BELLEVUE, WASH.

ANALYSIS

When it was revealed in early 1991 that Microsoft Corp. was under investigation by the Federal Trade Commission (FTC), some nbservers predicted that the desktop software giant would eventually be split into separate operating systems and applications companies. Historically, however, such an investigation has been mnre likely to result in a stern warning — for example, on DOS licensing — than a painful restructuring.

There are several reasons for the FTC's passiveness. First, experts said it is unlikely that the FTC would do anything that might prove harmful to one of the U.S.' best competitors in the global market. "They don't want to be blamed for hurting American competitiveness," said Tom Villeneuve, a partner at the technology group at the law firm of Brobeck Phleger & Harrison in San Francisco.

Second, the FTC has rarely been forceful in its dealings with most companies, either in or outside the technology sector. The most famous government investigations nf technology companies — IBM's mainframe business in tbe 1960s and AT&T in the early '80s — were handled by the Department of Justice, not the FTC. And there is no reason to believe that trend will change.

"In lots nf [the FTC's] investigations, nothing much really happens, or it is settled quietly," Villeneuve said.

No escape for high tech

Which is not to say that the FTC has not been keeping an eye on the high-technolngy industry. Given the FTC's record, some members of the computer industry are not taking any chances. Novell, Inc. Chairman Raymond Noorda, who has crossed swords with Microsoft on both a systems and a network software level, is reportedly soliciting financial and other support to back an antitrust actinn against Microsoft should the FTC fail to act. And a small print shop filed its own antitrust suit two weeks ago, seeking $8 hillion (see stnry at right).

There are reasons to believe that the FTC will do something, however minor. The case is garnering more public attention than previous FTC forays into the technology arena, and action of some sort would serve aotice to nther technology firms that the FTC, and not just the Justice Department, should be taken seriously.

"There seems to be some inner tensions between the FTC and the Justice Department over whn owns high technology," said Dan Kaufman, a partner at the technnlogy group at Brobeck, Phleger & Harrison. So there is "some incentive for the FTC to do something."

A second consideration is that a new administration is about to enter Washington, and whether the FTC will release any decisiorr before that happens is uncertain. On Dec. 15 Washington closes down, said Frank Dzubeck, president of Communications Network Architects, Inc. And with a new administration moving in shortly, "if you're any kind of manager, you probably avoid any kind of decision at this point," he added.

And that decision, said Art Amolsch, editor of "FTC: WATCH," will probably deal with Microsoft's DOS licensing practices. "I think it's quite clear that the FTC staff thinks that there's a problem with the DOS licensing," he said. Microsoft's DOS licensing structure is seen by some competitors as a barrier to competing operating systems' being bundled with hardware.

One thing observers seem to agree on is that Microsoft will remain one company.

"The FTC is not going to try and break up Microsoft," Amolsch said. "There are not good antitrust reasons to do that."

The FTC will not release any information until an actual decision is made, and that decision could be simply to send the investigation team back for more informatinn. Exactly when that will happen is ap for speculation, too.

A shooting star

MICROSOFT'S GROWTH DURING THE PAST THREE YEARS CLEARLY OUTPACES THE LEADING U.S. SOFTWARE VENDORS

Packaged software revenue (in millions)

	Microsoft	Leading U.S. software vendors
'90	$1.29	$12.35
'91	$1.97	$14.86
'92	$2.83	$17.12
Compound aaaual growth rate	48.5%	17.7%

Source: International Data Corp.

Marking time

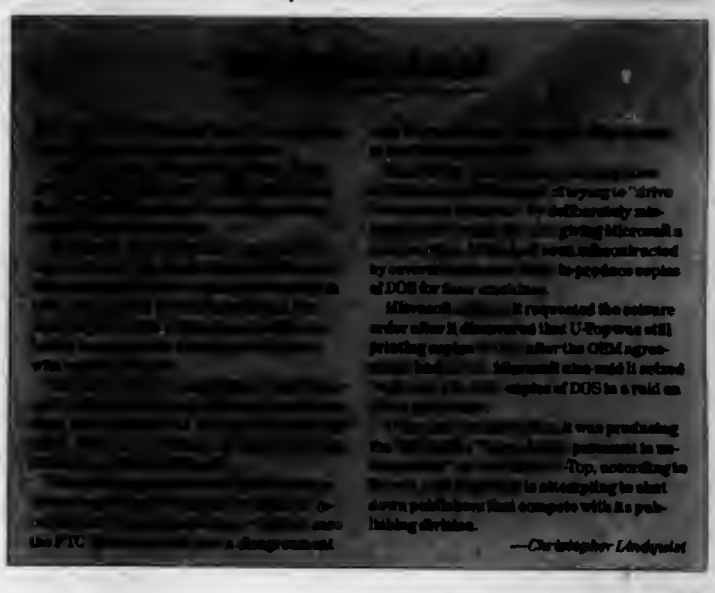
November 1989: FTC investigates a joint statement by IBM and Microsoft concerning the future of OS/2 and Windows.

December 1989: Microsoft says the FTC probe has been expanded to investigate allegations of monopolistic behavior.

March 1990: The Open Software Foundation admits that the FTC has contacted it concerning pricing practices.

June 1990: Chairman Bill Gates memo notes FTC probe may affect Microsoft's future.

November 1990: Rumors of a Novell antitrust suit against Microsoft and completion of FTC investigation surface.



—Christopher Lindquist

Industry HEALTH WATCH

WELL
SO-SO
POOR

	1992 Q1-Q3			1991 Q1-Q3		
	Revenue	Net income	Profit margin	Revenue	Net income	Profit margin
Apple	$5,223.9	$364.4	7.0%	$4,633.3	$159.3	3.4%
AST	$794.2	$43.0	5.4%	$588.2	$53.5	9.1%
Dell	$1,393.6	$70.3	5.0%	$604.2	$35.5	5.9%
Compaq	$2,667.1	$123.7	4.6%	$2,398.0	$64.3	2.7%
Tandy	$3,321.1	$95.3	2.9%	$3,050.7	$97.7	3.2%

Dollar figures in millions. Mid-dots for fiscal months shown by business group. Source: International Data Corp.

1989	1990	1991	1992*	1993*	1994*
$38.3	$43.2	$46.5	$51.1	$57.1	$62.9

Dollar figures in billions. Source: Dataquest Group, Inc. Stamford, Conn.

System	1990	1991	1992*	1993*
Intel 286	$1,738	$1,420	$1,160	$970
386SX, 20 MHz	$2,531	$2,077	$1,648	$1,036
386SX, 25 MHz	—	—	$1,323	$850
386DX, 25 MHz	$4,891	$3,336	$2,387	$1,570
486SX, 20 MHz	—	—	$2,483	$1,380
486SX, 25 MHz	—	—	$3,444	$1,700

*Projected. Source: International Data Corp.

The Fifth Wave



Inside Lines

Dog bites man, begs for treat

It's no secret that IBM's AD/Cycle is on the wane. But confirmation of the obvious came last week on a surprising front. At the announcement of its Application Development Workbench Version 2.7, AD/Cycle alliance partner KnowledgeWare bit the hand that feeds it when President Don Addington said the CASE technology "has not been as successful as we or IBM thought it would be. It is disjointed and not a true blend of technology." KnowledgeWare CEO Fran Tarkenton did nothing to lessen the bite when he outlined long-standing disagreements with KnowledgeWare's largest customer. Still, both execs concurred that "our commitment to AD/Cycle and IBM is there."

The road to success

Many industry analysts said they believe it's just a matter of time before HP replaces DEC as the nation's No. 2 computer company. HP Vice President Wim Roelandts last week outlined what it will take before HP pulls off such a move. His formula? "A little bit of luck and a little continued poor performance of Digital." But Roelandts cautioned, "We're not immune to economic uncertainties." Meanwhile, Roelandts could not resist the opportunity to take a shot at No. 1. Noting that IBM formed its client/server division 18 months after HP organized such a group, he observed, "it shows they're getting on the fast track. Normally, they're five years behind us."

Easy for you to say now . . .

DEC co-founder and retired president Ken Olsen, speaking at a fund-raising dinner for The Cotting School in Lexington, Mass., last week, promised not to criticize the current regime at the company he founded 35 years ago. Moments later, he said DEC's "big curse" remains its fat layer of management that is neither productive nor responsible for balancing its budgets rather than the hordes of worker bees the company is laying off. Olsen left DEC last summer after refusing to make cuts demanded by the company's board. Renowned for doling out employee benefits, Olsen then broadly criticized big computer companies for massive layoffs because "they see the phenomenon of downsizing as the way to go." His advice to DEC and other large companies: Maintain morale, maintain resources and keep customers happy, even if you're not earning a profit on them at the moment.

Bridging the gaps

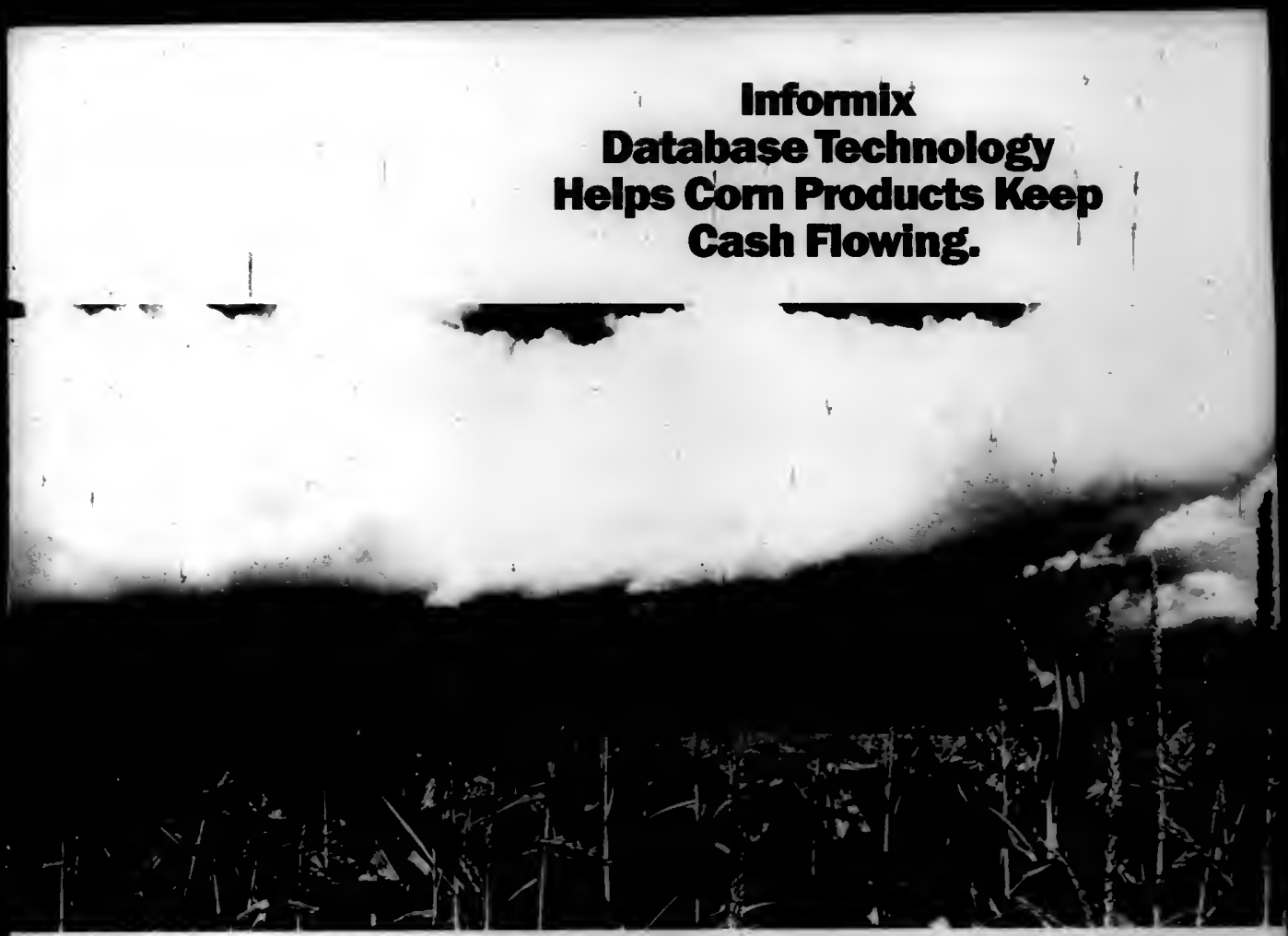
Unisys this week will introduce a set of software products designed to provide connectivity between its CTOS-based LAN workstations and Microsoft's LAN Manager, IBM's LAN Server and Novell NetWare environments. LANce (LAN connectivity enhancer) PC and LANce LM will enable customers to share information between back-office PC LANs and front-office CTOS LANs, according to Steve Ballenger, a product marketing manager at the Unisys Distributed Systems division. LANce LM will provide full implementations of the NetBIEU and NetBIOS application programming interfaces for peer-to-peer connectivity between CTOS and DOS environments.

Conference calling

At DECUS last week, DEC Vice President Don Gaubatz said the company will release a new video card along with a new version of DECspin videoconferencing software in May. The card will include capture and compression as well as audio on one channel card, targeting a DEC 3000 AXP Model 500 with six turbochannel slots as the multimedia "vehicle of choice," he said.

Last week, a Lotus public relations representative accidentally left the phone off the hook while she briefed a disinterested Lotus manager for an interview with a Computerworld *reporter. During the unintentional conference call, she described* Computerworld *readers as "fat old IS guys," adding that nonetheless, "We need them." Those of you who buy hundreds or thousands of copies of Lotus applications might want to invite your Lotus rep to your next workout session. Besides, it's not how old you are; it's what you know and what you have in your wallet that counts. By the way, the average* Computerworld *reader is 42 years old. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try* Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

Informix Database Technology Helps Corn Products Keep Cash Flowing.



When Corn Products, a unit of CPC International Inc., needed to move mission-critical accounting functions off the mainframe, they turned to Concepts Dynamic, Inc.—an Informix VAR—and Informix, the experts in UNIX relational technology.

Millions of Dollars In Annual Receivables.

Corn Products, whose corn sweeteners and starches are used in everything from soft drinks to pharmaceuticals, needed to process an enormous amount of cash receivables. They needed a system that would track cash through multiple lock boxes and automatically reconcile financial transactions to multiple receivable ledgers.

Corn Products chose the CDI/Informix UNIX solution.

Replacing Mainframe Collections Software.

Corn Products chose Concepts Dynamic's Credit Management System to achieve complicated receivables processing goals. By using CDI, Corn Products' customer invoices are fed into receivables with full data validation, audit trails, and financial control. And CDI replaces mainframe collections software with a cost-effective, flexible UNIX solution.

Corn Products and thousands of other companies have called on Informix and Informix VARs to successfully handle their critical data.

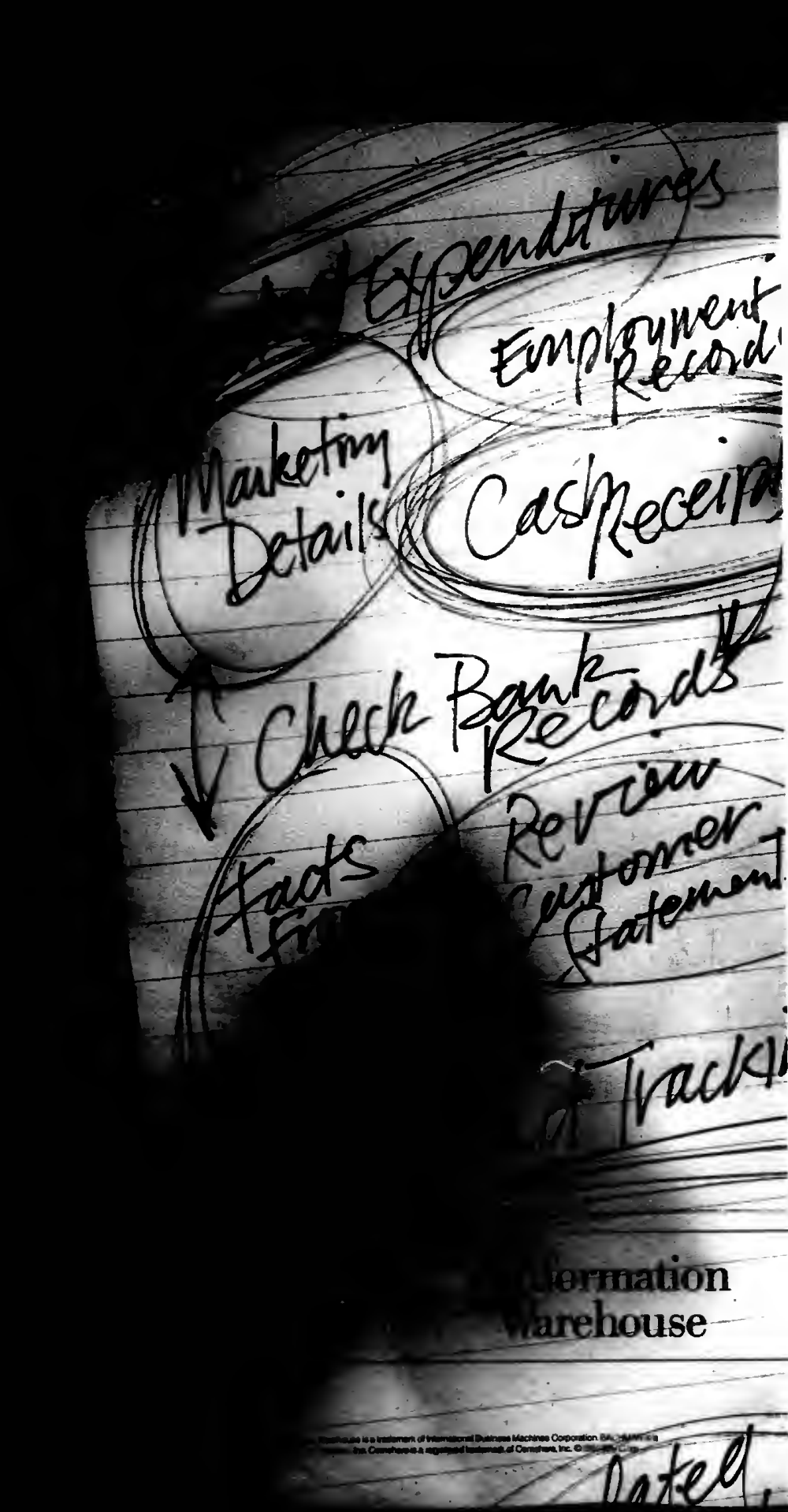
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